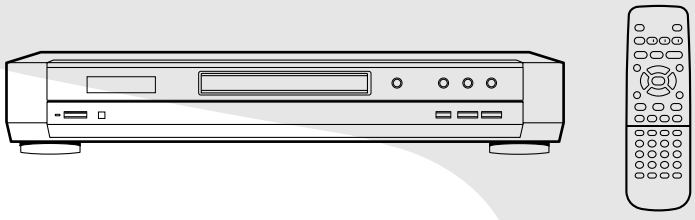
TOSHIBA

FILE NO. 810-200207

SERVICE MANUAL

DVD VIDEO PLAYER

SD-2550A
SD-2550H
SD-2550T



Jun., 2002 Ⓢ

LASER BEAM CAUTION LABEL

CAUTION
VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN. DO NOT STARE INTO BEAM OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS.
ATTENTION
RAYONNEMENT VISIBLE ET INVISIBLE LASER EN CAS D'OUVERTURE. NE PAS REGARDER DANS LE FAISCEAU. NI À L'O EIL NU NI À L'AIDE D'INSTRUNENTS D'OPTIQUE.
VORSICHT
SICHTBARE UND UNSICHTBARE LASERSTRAHLUNG WENN ABDECKUNG GEÖFFNET. NICHT IN DEN STRAHL BLICKEN AUCH NICHT MIT OPTISCHEN INSTRUMENTEN.
注 意 ここを開くと可視レーザー光及び不可視レーザー光がでます。ビームを直接見たり触れたりしないこと。光学機器で直接ビームを見ないこと。
ADVARSEL
SYNLIG OG USYNLIG LASERSTRÅLING VED ÅBNING. SE IKKE IND I STRÅLEN-HELLER IKKE MED OPTISKE INSTRUMENTER.
ADVARSEL
SYNLIG OG USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES. STIRR IKKE INN I STRÅLEN ELLER SE DIREKTE MED OPTISKE INSTRUMENTR.
VARO!
AVATTAESSA OLET ALTTINA NÄKYVÄÄ JA NÄKYMÄTÖN LASERSÄTEIL YLLE. ÄLÄ TUIJOTA SÄTEESEEN ÄLÄKÄ KATSO SITÄ OPTISEN LAITTEEN LÄPI.
VARNING
SYNLIG OCH OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD. STIRRA EJ IN I STRÅLEN OCH BETRAKTA EJ STRÅLEN MED OPTISKA INSTRUMENT.
98764189

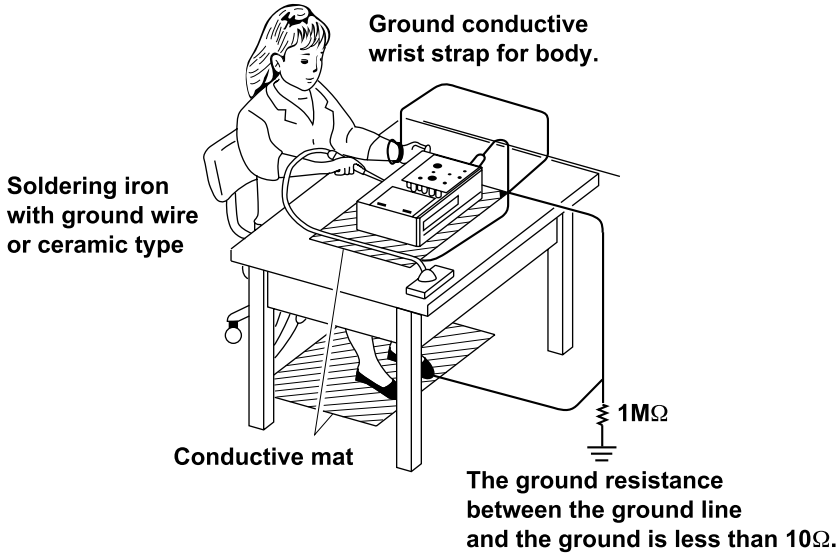
When the power supply is being turned on, you may not remove this laser cautions label. If it removes, radiation of a laser may be recceived.

PREPARATION OF SERVICING

Pickup Head consists of a laser diode that is very susceptible to external static electricity.

Although it operates properly after replacement, if it was subject to electrostatic discharge during replacement, its life might be shortened. When replacing, use a conductive mat, soldering iron with ground wire, etc. to protect the laser diode from damage by static electricity.

And also, the LSI and IC are same as above.


Ground conductive wrist strap for body.
Soldering iron with ground wire or ceramic type
1MΩ
Conductive mat
The ground resistance between the ground line and the ground is less than 10Ω.

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Specifications

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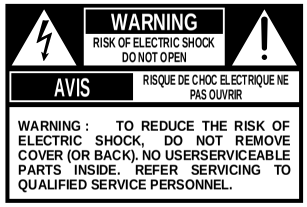
SAFETY PRECAUTIONS


WARNING
RISK OF ELECTRIC SHOCK
DO NOT OPEN
AVIS
RISQUE DE CHOC ELECTRIQUE NE PAS OUVRIR
WARNING : TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USERSERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

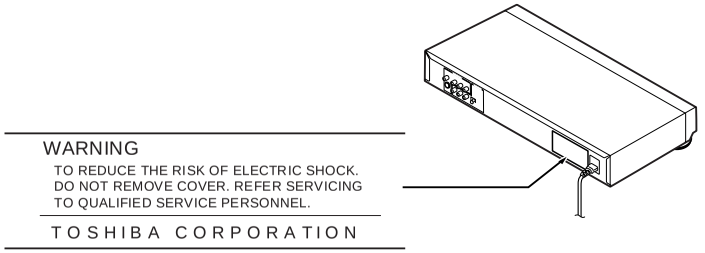
WARNING: **TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE. DANGEROUS HIGH VOLTAGES ARE PRESENT INSIDE THE ENCLOSURE. DO NOT OPEN THE CABINET. REFER SERVICING TO QUALIFIED PERSONNEL ONLY.**

CAUTION: This Digital Video Disc Player employs a Laser System.
To ensure proper use of this product, please read this owner’s manual carefully and retain for future reference. Should the unit require maintenance, contact an authorized service location - see service procedure.

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

To prevent direct exposure to laser beam, do not try to open the enclosure.
Visible and invisible laser radiation when open and interlocks defeated.
DO NOT STARE INTO BEAM.

Location of the required label


WARNING
TO REDUCE THE RISK OF ELECTRIC SHOCK.
DO NOT REMOVE COVER. REFER SERVICING
TO QUALIFIED SERVICE PERSONNEL.
TOSHIBA CORPORATION

In the spaces provided below, record the Model and Serial No. located on the rear panel of your DVD video player.

Model No. _____ Serial No. _____

Retain this information for future reference.

SECTION 1
GENERAL DESCRIPTIONS

1. OPERATING INSTRUCTIONS (SD-2550A/H)

IMPORTANT SAFETY INSTRUCTIONS

CAUTION: PLEASE READ AND OBSERVE ALL WARNINGS AND INSTRUCTIONS GIVEN IN THIS OWNER'S MANUAL AND THOSE MARKED ON THE UNIT. RETAIN THIS BOOKLET FOR FUTURE REFERENCE.

This set has been designed and manufactured to assure personal safety. Improper use can result in electric shock or fire hazard. The safeguards incorporated in this unit will protect you if you observe the following procedures for installation, use and servicing. This unit is fully transistorized and does not contain any parts that can be repaired by the user.
DO NOT REMOVE THE CABINET COVER, OR YOU MAY BE EXPOSED TO DANGEROUS VOLTAGE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL ONLY.

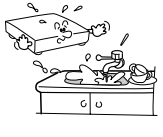
1. Read these instructions.

2. Keep these instructions.

3. Heed all warnings.

4. Follow all instructions.

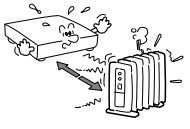
5. Do not use this apparatus near water.



6. Clean only with dry cloth.

7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.



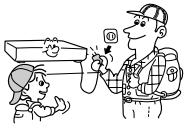
9. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

10. Only use attachments/accessories specified by the manufacturer.

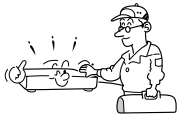
11. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

IMPORTANT SAFETY INSTRUCTIONS

12. Unplug this apparatus during lightning storms or when unused for long periods of time.

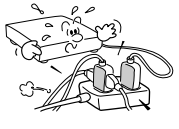


13. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.



14. When you use headphones, keep the volume at a moderate level. If you use the headphones continuously with high volume sound, it may cause hearing damage.

15. Do not overload wall outlets; extension cords, or integral convenience receptacles as this can result in a risk of fire or electric shock.



16. Never insert objects of any kind into this apparatus through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the apparatus.

17. Keep your fingers well clear of the disc tray as it is closing. Neglecting to do so may cause serious personal injury.

18. Do not place a heavy object on or step on the apparatus. The object may fall, causing serious personal injury and serious damage to the apparatus.

19. Do not use a cracked, deformed, or repaired disc. These discs are easily broken and may cause serious personal injury and apparatus malfunction.

1-3

Precautions

Notes on handling

- When shipping the DVD video player, the original shipping carton and packing materials come in handy. For maximum protection, repack the unit as it was originally packed at the factory.
- Do not use volatile liquids, such as insect spray, near the DVD video player. Do not leave rubber or plastic products in contact with the DVD video player for a long time. They will leave marks on the finish.
- The top and rear panels of the DVD video player may become warm after a long period of use. This is not a malfunction.
- When the DVD video player is not in use, be sure to remove the disc and turn off the power.
- If you do not use the DVD video player for a long period, the unit may not function properly in the future. Turn on and use the DVD video player occasionally.

Notes on locating

- Place the DVD video player on a level surface. Do not use it on a shaky or unstable surface such as a wobbling table or inclined stand. The loaded disc may come off the proper position and cause damage to the DVD video player.
- When you place this DVD video player near a TV, radio, or VTR, the playback picture may become poor and the sound may be distorted. In this case, place the DVD video player away from the TV, radio, or VTR.

Notes on cleaning

Use a soft, dry cloth for cleaning.

- For stubborn dirt, soak the cloth in a weak detergent solution, wring well and wipe. Use a dry cloth to wipe it dry.
  Do not use any type of solvent, such as thinner and benzine, as they may damage the surface of the DVD video player.
- If you use a chemical saturated cloth to clean the unit, follow that product's instructions.

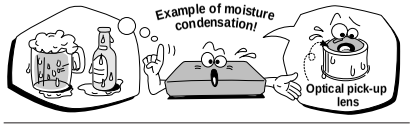
To obtain a clear picture

The DVD video player is a high technology, precision device. If the optical pick-up lens and disc drive parts are dirty or worn down, the picture quality becomes poor. To obtain a clear picture, we recommend regular inspection and maintenance (cleaning or parts replacement) every 1,000 hours of use depending on the operating environment. For details, contact your nearest dealer.

Notes on moisture condensation

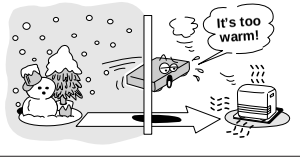
Moisture condensation damages the DVD video player. Please read the following carefully.

Moisture condensation occurs, for example, when you pour a cold drink into a glass on a warm day. Drops of water form on the outside of the glass. In the same way, moisture may condense on the optical pick-up lens inside this unit, one of the most crucial internal parts of the DVD video player.



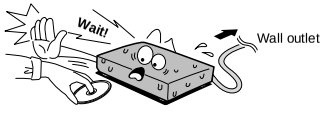
■ **Moisture condensation occurs during the following cases.**

- When you bring the DVD video player directly from a cold place to a warm place.
- When you use the DVD video player in a room where you just turned on the heater, or a place where the cold wind from the air conditioner directly hits the unit.
- In summer, when you use the DVD video player in a hot and humid place just after you move the unit from an air conditioned room.
- When you use the DVD video player in a humid place.



■ **Do not use the DVD video player when moisture condensation may occur.**

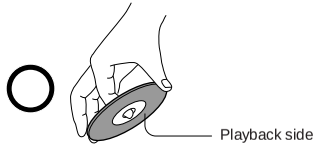
If you use the DVD video player in such a situation, it may damage discs and internal parts. Remove the disc, connect the power cord of the DVD video player to the wall outlet, turn on the DVD video player, and leave it for two or three hours. After two or three hours, the DVD video player will have warmed up and evaporated any moisture. Keep the DVD video player connected to the wall outlet and moisture condensation will seldom occur.



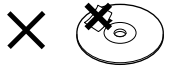
Notes on Discs

On handling discs

- Do not touch the playback side of the disc.



- Do not attach paper or tape to discs.



On cleaning discs

- Fingerprints and dust on the disc cause picture and sound deterioration. Wipe the disc from the center outwards with a soft cloth. Always keep the disc clean.

- If you cannot wipe off the dust with a soft cloth, wipe the disc lightly with a slightly moistened soft cloth and finish with a dry cloth.
- Do not use any type of solvent such as thinner, benzine, commercially available cleaners or antistatic spray for vinyl LPs. It may damage the disc.

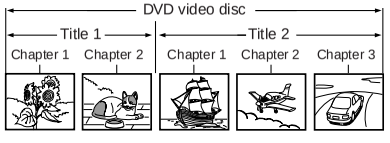
On storing discs

- Do not store discs in a place subject to direct sunlight or near heat sources.
- Do not store discs in places subject to moisture and dust such as a bathroom or near a humidifier.
- Store discs vertically in a case. Stacking or placing objects on discs outside of their case may cause warping.

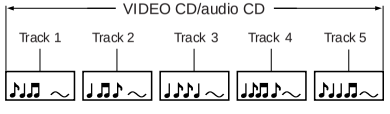
Structure of disc contents

Normally, DVD video discs are divided into titles, and the titles are sub-divided into chapters. VIDEO CDs/ audio CDs are divided into tracks.

DVD video disc



VIDEO CD/audio CD



Each title, chapter or track is assigned a number, which is called "title number", "chapter number" or "track number" respectively.
There may be discs that do not have these numbers.

Notes on copyright

It is forbidden by law to copy, broadcast, show, broadcast on cable, play in public, and rent copyrighted material without permission.

DVD video discs are copy protected, and any recordings made from these discs will be distorted.

This product incorporates copyright protection technology that is protected by method claims of certain U.S. patents and other intellectual property rights owned by Macrovision Corporation and other rights owners. Use of this copyright protection technology must be authorized by Macrovision Corporation, and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision Corporation. Reverse engineering or disassembly is prohibited.

Notes on Discs (continued)

About this owner's manual

This owner's manual explains the basic instructions of this DVD video player. Some DVD video discs are produced in a manner that allows specific or limited operation during playback. As such, the DVD video player may not respond to all operating commands. This is not a defect in the DVD video player. Refer to instruction notes of discs.

"⃠" may appear on the TV screen during operation. A "⃠" means that the operation is not permitted by the DVD video player or the disc.

Notes on region numbers

The DVD video player is allotted one of region numbers, which stand for their playable area. If the numbers are printed on your DVD video disc, and are different from that of the DVD video player, disc playback will not be allowed by the player. (In this case, the DVD video player displays the message.)
The region number of this DVD video player is printed on the rear panel of the main unit and on the carton.

On VIDEO CDs

This DVD video player supports VIDEO CDs equipped with the PBC (Version 2.0) function. (PBC is the abbreviation of Playback Control.) You can enjoy two playback variations depending on types of discs.

- **VIDEO CD not equipped with PBC function (Version 1.1)**
  Sound and movie can be played on this DVD video player in the same way as an audio CD.
- **VIDEO CD equipped with PBC function (Version 2.0)**
  In addition to operation of a VIDEO CD not equipped with the PBC function, you can enjoy playback of interactive software with search function by using the menu displayed on the TV screen (Menu Playback). Some of the functions described in this owner's manual may not work with some discs.

Playable discs

This DVD video player can play the following discs.

	Disc Mark	Contents	Disc Size	Maximum playback time
DVD video discs	DVD VIDEO / DVD VIDEO	Audio + video (moving pictures)	12 cm	Approx. 4 hours (single sided disc)
				Approx. 8 hours (double sided disc)
			8 cm	Approx. 80 minutes (single sided disc)
				Approx. 160 minutes (double sided disc)
VIDEO CDs	COMPACT disc DIGITAL VIDEO	Audio + video (moving pictures)	12 cm	Approx. 74 minutes
			8 cm	Approx. 20 minutes
Audio CDs	COMPACT disc DIGITAL AUDIO	Audio	12 cm	Approx. 74 minutes
			8 cm (CD single)	Approx. 20 minutes

The following discs are also available.
● DVD-R discs of DVD video format
● CD-R/CD-RW discs of CD-DA or VIDEO CD format
Some of these discs may be incompatible.

- You cannot play discs other than those listed above.
- You cannot play DVD-RAM discs or non-standardized discs, etc., even if they may be labeled as above.
- This DVD video player uses the NTSC/PAL color system, and cannot play DVD video discs recorded in any other color system (SECAM, etc.).

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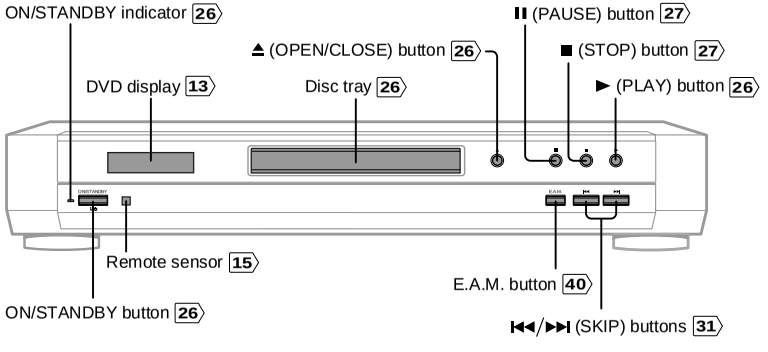
● **Specifications 59**

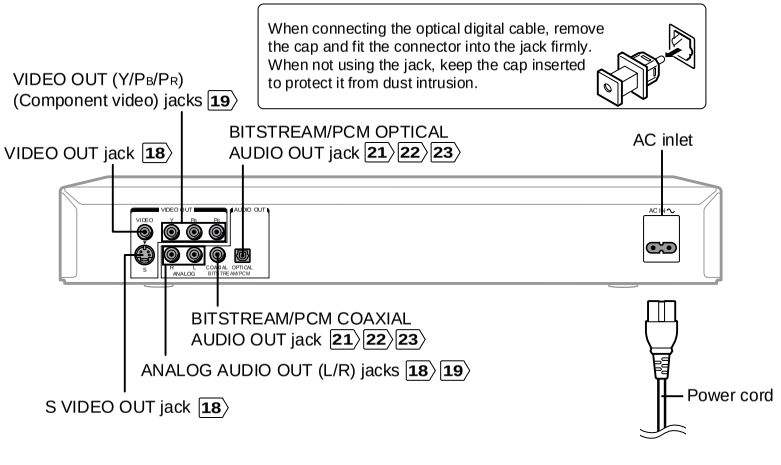
Identification of Controls

See the page in ⟨ ⟩ for details.

Front panel

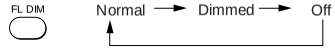


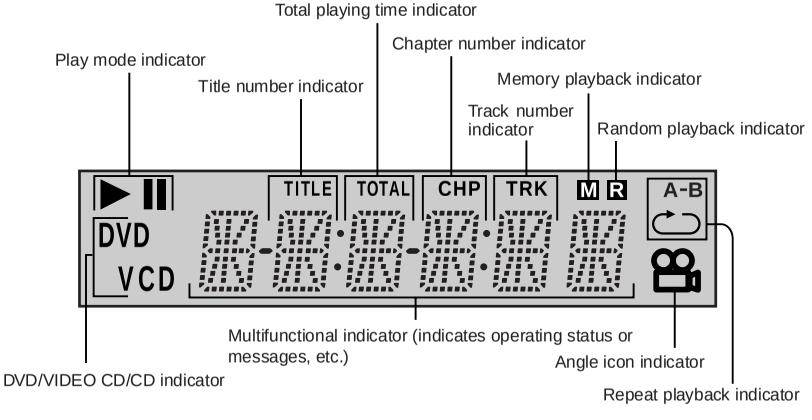
Rear panel


When connecting the optical digital cable, remove the cap and fit the connector into the jack firmly. When not using the jack, keep the cap inserted to protect it from dust intrusion.
VIDEO OUT (Y/PB/PR) (Component video) jacks 19
VIDEO OUT jack 18
BITSTREAM/PCM OPTICAL AUDIO OUT jack 21 22 23
AC inlet
BITSTREAM/PCM COAXIAL AUDIO OUT jack 21 22 23
ANALOG AUDIO OUT (L/R) jacks 18 19
S VIDEO OUT jack 18
Power cord

DVD display

■ **Pressing of the FL DIM button on the remote control changes the brightness of the display.**





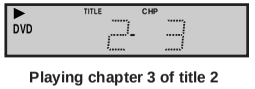
■ **When you start playback, the elapsed time indicators appear. Pressing the FL SELECT button switches them to the title/chapter/track number indicators. Some discs may not permit this operation.**

The indicators vary depending on the kinds of discs you play.

DVD video disc

- During playback:

Example



Playing chapter 3 of title 2

Some discs may not display chapter numbers or elapsed time.

VIDEO CD

- During playback:

Example

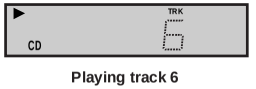
Playing track 6

Some discs may not display track numbers or elapsed time.

Audio CD

- During playback:

Example



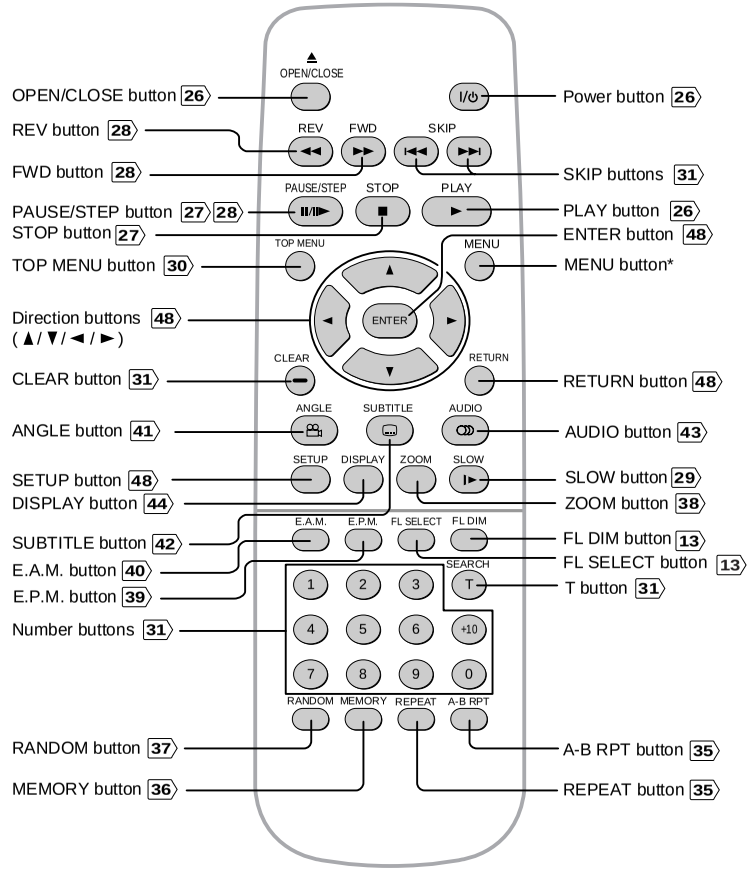
Playing track 6

1-6

Identification of Controls (continued)

The instructions in this manual describe the functions on the remote control. See the page in ▭ for details.

Remote control

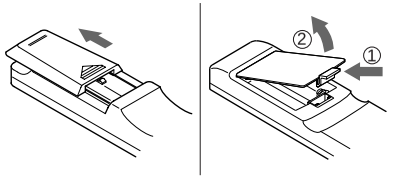


*** MENU button**
Use the MENU button to display the menu included on many DVD video discs. To operate a menu, follow the instructions in "Locating a title using the top menu." 30

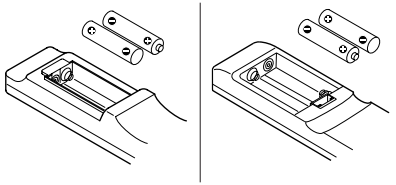
■ **About the illustrations of the battery compartment**
There are two types of battery compartment in the supplied remote controls. (This does not mean a difference in performance between the two.)
Refer to either illustration depending on the actual remote control.

Loading batteries

1 Open the cover.



2 Insert batteries (R6 size).



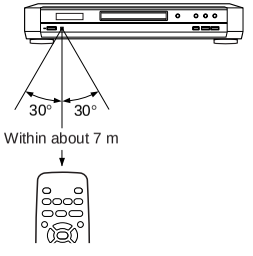
Make sure to match the + and – on the batteries to the marks inside the battery compartment.

3 Close the cover.

Notes on batteries
Improper use of batteries may cause battery leakage and corrosion. To operate the remote control correctly, follow the instructions below.
- Do not insert batteries into the remote control in the wrong direction.
- Do not charge, heat, open, or short-circuit the batteries. Do not throw batteries into a fire.
- Do not leave dead or exhausted batteries in the remote control.
- Do not use different types of batteries together, or mix old and new batteries.
- If you do not use the remote control for a long period of time, remove the batteries to avoid possible damage from battery corrosion.
- If the remote control does not function correctly or if the operating range becomes reduced, replace all batteries with new ones.
- If battery leakage occurs, wipe the battery liquid from the battery compartment, then insert new batteries.

Operating with the remote control

Point the remote control at the remote sensor and press the buttons.



Distance: About 7 m from the front of the remote sensor
Angle: About 30° in each direction of the front of the remote sensor

* Do not expose the remote sensor of the DVD video player to a strong light source such as direct sunlight or other illumination. If you do so, you may not be able to operate the DVD video player via the remote control.

Notes on the remote control
- Direct the remote control at the remote sensor of the DVD video player.
- Do not drop or give the remote control a shock.
- Do not leave the remote control near an extremely hot or humid place.
- Do not spill water or put anything wet on the remote control.
- Do not open the remote control.

1-7

Connections

Read this chapter first to make all necessary preparations.

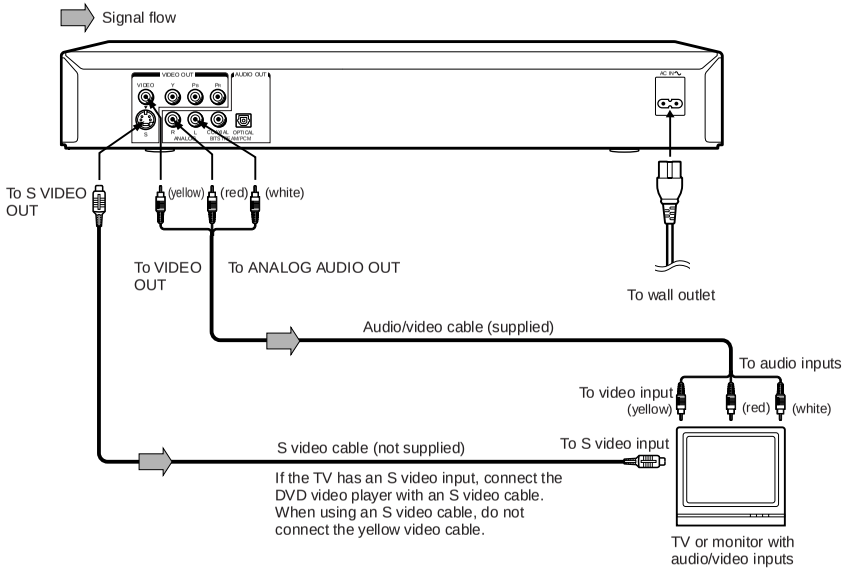
- **Connecting to a TV**
- **Connecting to an audio system and TV equipped with component video inputs**
- **Connecting to an amplifier equipped with a Dolby Digital decoder**
- **Connecting to an amplifier equipped with Dolby Pro Logic Surround**
- **Connecting to an amplifier equipped with a DTS decoder**
- **Connecting to an amplifier equipped with an MPEG2 audio decoder**
- **Connecting to an amplifier equipped with a digital audio input**

Connecting to a TV

Connect the DVD video player to your TV.

For details of output sound, see 43.

Connecting to a TV


Signal flow
To S VIDEO OUT
(yellow)
(red)
(white)
To VIDEO OUT
To ANALOG AUDIO OUT
To wall outlet
Audio/video cable (supplied)
To audio inputs
To video input
(yellow)
(red)
(white)
S video cable (not supplied)
To S video input
If the TV has an S video input, connect the DVD video player with an S video cable. When using an S video cable, do not connect the yellow video cable.
TV or monitor with audio/video inputs

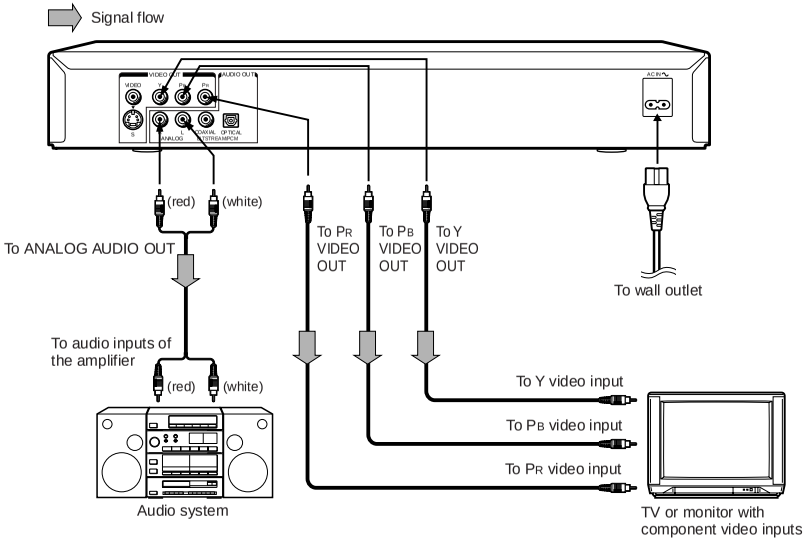
• Make the following setting.

On-screen display	Select:	Page
"Audio Out Select"	"Analog 2ch"	48 50

Notes

- Refer to the owner's manual of the connected TV as well.
- When you connect the DVD video player to your TV, be sure to turn off the power and unplug both units from the wall outlet before making any connections.
- If your television set has one audio input, connect the DVD video player to a Y cable adapter (not supplied) and then connect to your TV.
- Connect the DVD video player directly to your TV. If you connect the DVD video player to a VTR, TV/VTR combination or video selector, the playback picture may be distorted as DVD video discs are copy protected.

Connecting to an audio system and TV equipped with component video inputs



Component video outputs/inputs

Some TVs or monitors are equipped with component video inputs. Connecting to these inputs allows you to enjoy higher quality picture playback.
Actual labels for component video inputs may vary depending on the TV manufacturer. (ex. Y, R-Y, B-Y or Y, C_B, C_R)
In some TVs or monitors, the color levels of the playback picture may be reduced slightly or the tint may change. In such a case, adjust the TV or monitor for optimum performance.

• Make the following setting.

On-screen display	Select:	Page
"Audio Out Select"	"Analog 2ch"	48 50

Notes

- Refer to the owner's manual of the connected equipment as well.
- When you connect the DVD video player to other equipment, be sure to turn off the power and unplug all of the equipment from the wall outlet before making any connections.
- If you place the DVD video player near a tuner or radio, the radio broadcast sound might be distorted. In this case, place the DVD video player away from the tuner and radio.
- The output sound of the DVD video player has a wide dynamic range. Be sure to adjust the receiver's volume to a moderate listening level. Otherwise, the speakers may be damaged by a sudden high volume sound.
- Turn off the amplifier before you connect or disconnect the DVD video player's power cord. If you leave the amplifier power on, the speakers may be damaged.

Connecting to Optional Equipment

You can enjoy high quality dynamic sounds by connecting the DVD video player to optional audio equipment.

- For connection to your TV, see “Connecting to a TV” 18 19.
- For details of output sound, see 43.
- This section uses the following reference marks.

: Front speaker
: Rear speaker
: Sub woofer
: Center speaker
: Signal flow

Notes

- DO NOT connect the BITSTREAM/PCM (DIGITAL) AUDIO OUT jack of the DVD video player to the AC-3 RF input of a Dolby Digital Receiver. This input on your A/V Receiver is reserved for Laserdisc use only and is incompatible with the BITSTREAM/PCM (DIGITAL) AUDIO OUT jack of the DVD video player.
- Connect the BITSTREAM/PCM (DIGITAL) AUDIO OUT jack of the DVD video player to the “DIGITAL (OPTICAL)” or “DIGITAL (COAXIAL)” input of a Receiver or Processor.
- Refer to the owner’s manual of the connected equipment as well.
- When you connect the DVD video player to other equipment, be sure to turn off the power and unplug all of the equipment from the wall outlet before making any connections.
- The output sound of the DVD video player has a wide dynamic range. Be sure to adjust the receiver’s volume to a moderate listening level. Otherwise, the speakers may be damaged by a sudden high volume sound.
- Turn off the amplifier before you connect or disconnect the DVD video player’s power cord. If you leave the amplifier power on, the speakers may be damaged.

Warning

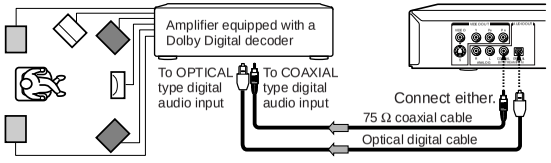
- When you are connecting (via the BITSTREAM/PCM (DIGITAL) AUDIO OUT jack) an AV decoder that does not have Dolby Digital, Digital Theater Systems (DTS) or MPEG2 decoding function, be sure to set “Audio Out Select” to “PCM” from the on-screen displays 48 50. Otherwise, high volume sound may damage your hearing as well as the speakers.
- When playing DTS-encoded discs (audio CDs), excessive noise may be output from the analog audio output jacks. To avoid possible damage to the audio system, you should take proper precautions when the analog audio output jacks of the DVD video player are connected to an amplification system. To enjoy DTS Digital Surround™ playback, an external 5.1 channel DTS Digital Surround™ decoder system must be connected to the BITSTREAM/PCM (DIGITAL) AUDIO OUT jack of the DVD video player.

Connecting to an amplifier equipped with a Dolby Digital decoder

Dolby Digital

Dolby Digital is the surround sound technology used in theaters showing the latest movies, and is now available to reproduce this realistic effect in the home. You can enjoy motion picture and live concert DVD video discs with this dynamic realistic sound by connecting the DVD video player to a 6 channel amplifier equipped with a Dolby Digital decoder or Dolby Digital processor. If you have a Dolby Pro Logic Surround decoder, you will obtain the full benefit of Pro Logic from the same DVD movies that provide full 5.1-channel Dolby Digital soundtracks, as well as from titles with the Dolby Surround mark.

Manufactured under license from Dolby Laboratories. “Dolby”, “Pro Logic”, and the double-D symbol are trademarks of Dolby Laboratories. Confidential unpublished works. Copyright 1992-1997 Dolby Laboratories. All rights reserved.


Amplifier equipped with a Dolby Digital decoder
To OPTICAL type digital audio input
To COAXIAL type digital audio input
Connect either.
75 Ω coaxial cable
Optical digital cable

- Use DVD video discs encoded via the Dolby Digital recording system.
- Make the following setting.

On-screen display	Select:	Page
“Audio Out Select”	“Bitstream”	48 50
Recording system	D	43

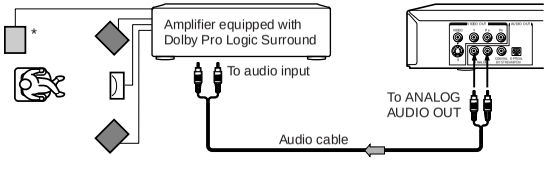
Connecting to an amplifier equipped with Dolby Pro Logic Surround

Dolby Pro Logic Surround

You can enjoy the dynamic realistic sound of Dolby Pro Logic Surround by connecting an amplifier and speaker system (right and left front speakers, a center speaker, and one or two rear speakers).

- With an amplifier equipped with Dolby Digital
  Connect the equipment the same way as described in “Connecting to an amplifier equipped with a Dolby Digital decoder.” Refer to that amplifier’s owner’s manual and set the amplifier so you can enjoy Dolby Pro Logic Surround sound.

- With an amplifier not equipped with Dolby Digital
  Connect the equipment as follows.



- Make the following setting.

On-screen display	Select:	Page
“Audio Out Select”	“Analog 2ch”	48 50

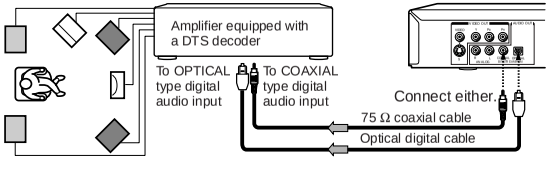
Be sure to set “Audio Out Select” to “Analog 2ch” when you enjoy sounds of Dolby Pro Logic Surround using this connection.

* Connect one or two rear speakers.
The output sound from the rear speakers will be monaural even if you connect two rear speakers.

Connecting to Optional Equipment (continued)

Connecting to an amplifier equipped with a DTS decoder

Digital Theater Systems (DTS)
DTS is a high quality surround technology used in theaters and now available for home use, on DVD video discs or audio CDs.
If you have a DTS decoder or processor, you can obtain the full benefit of 5.1 channel DTS encoded sound tracks on DVD video discs or audio CDs.


Amplifier equipped with a DTS decoder
To OPTICAL type digital audio input
To COAXIAL type digital audio input
Connect either.
75 Ω coaxial cable
Optical digital cable

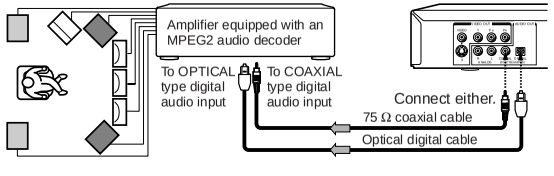
"DTS" and "DTS Digital Out" are trademarks of Digital Theater Systems, Inc.

- Use DVD video discs or audio CDs encoded via the DTS recording system.
- Make the following setting.

On-screen display	Select:	Page
"Audio Out Select"	"Bitstream"	48 50
Recording system	DTS	43

Connecting to an amplifier equipped with an MPEG2 audio decoder

MPEG2 sound
You can enjoy motion picture and live concert DVD video discs with dynamic realistic sound by connecting an amplifier equipped with an MPEG2 audio decoder or MPEG2 audio processor.

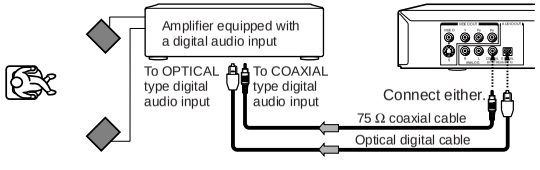

Amplifier equipped with an MPEG2 audio decoder
To OPTICAL type digital audio input
To COAXIAL type digital audio input
Connect either.
75 Ω coaxial cable
Optical digital cable

- Use DVD video discs encoded via the MPEG2 recording system.
- Make the following setting.

On-screen display	Select:	Page
"Audio Out Select"	"Bitstream"	48 50
Recording system	MPEG2	43

Connecting to an amplifier equipped with a digital audio input

2 channel digital stereo
You can enjoy the dynamic sound of 2 channel digital stereo by connecting an amplifier equipped with a digital audio input and speaker system (right and left front speakers).


Amplifier equipped with a digital audio input
To OPTICAL type digital audio input
To COAXIAL type digital audio input
Connect either.
75 Ω coaxial cable
Optical digital cable

- Make the following setting.

On-screen display	Select:	Page
"Audio Out Select"	"PCM"	48 50

Basic playback

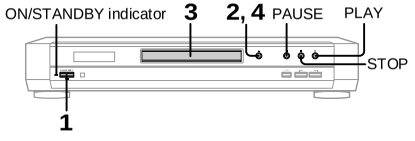
Begin your operation.

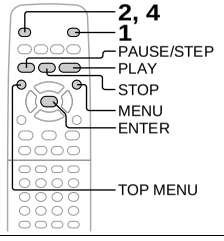
- **Playing a Disc**
- **Variable Speed Playback**
- **Locating a Desired Section**
- **Playing an MP3 Encoded CD**

Playing a Disc

This section shows you the basics on how to play a disc.

CAUTION
Keep your fingers well clear of the disc tray as it is closing. Neglecting to do so may cause serious personal injury.





■ **To obtain a higher quality picture**
Occasionally, some picture noise not usually visible during a normal broadcast may appear on the TV screen while playing a DVD video disc because the high resolution pictures on these discs include a lot of information. While the amount of noise depends on the TV you use with this DVD video player, you should generally reduce the sharpness adjustment on your TV when viewing DVD video discs.

■ **About** DVD VCD CD
The DVD VCD CD icons on the heading bar show the playable discs for the function described under that heading.
DVD : You can use this function with DVD video discs.
VCD : You can use this function with VIDEO CDs.
CD : You can use this function with audio CDs.

DVD VCD CD Basic playback

Preparations
- When you want to view a disc, turn on the TV and select the video input connected to the DVD video player.
- When you want to enjoy the sound of discs from the audio system, turn on the audio system and select the input connected to the DVD video player.

1 Press the power button (ON/STANDBY).

I/⏻

The DVD video player turns on and the color of the ON/STANDBY indicator changes from red (standby) to green (on).

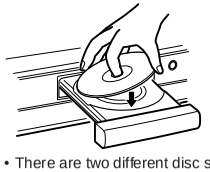
When the DVD video player is turned on for the first time, a message appears. Press ENTER, and make the proper settings before proceeding to step 2. 55

2 Press OPEN/CLOSE.

⏏ OPEN/CLOSE

The disc tray opens.

3 Place the disc on the disc tray.



With the playback side down

- There are two different disc sizes. Place the disc in the correct guide on the disc tray. If the disc is out of the guide, it may damage the disc and cause the DVD video player to malfunction.
- Do not place a disc which is unplayable in this DVD video player.

4 Press OPEN/CLOSE to close the disc tray.

⏏ OPEN/CLOSE

Playback starts.

If you insert a DVD video disc that contains a top menu, a menu may appear. See “Locating a title using the top menu.” 30
- You may need to press the TOP MENU or MENU button to display disc menu (depending on the actual DVD video disc.)

Note
If the disc tray contains a disc you have already played, playback will begin from the location where you last stopped playback. 29

■ **To start playback in the stop mode**
Press **PLAY**.

PLAY ►

■ **To pause playback (still mode)**
Press **PAUSE/STEP** during playback.

PAUSE/STEP ⏸/►

To resume normal playback, press the PLAY button.
- Sound is muted during still mode.

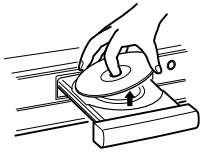
■ **To stop playback**
Press **STOP**.

STOP ■

■ **To remove the disc**
Press **OPEN/CLOSE**.

⏏ OPEN/CLOSE

Remove the disc after the disc tray opens completely.



Be sure to press the OPEN/CLOSE button to close the disc tray after you remove the disc.

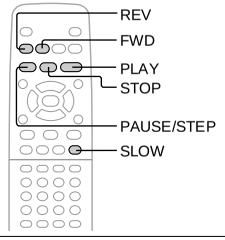
■ **About the screen saver**
If you pause a picture of a DVD video disc and leave it still for a long while, the screen saver of the DVD video player automatically appears (when “Screen Saver” is set to “On” 53). To turn off the screen saver, press the PLAY button.

■ **Automatic Power Off function**
If the DVD video player is stopped, or the screen saver is engaged for approximately 20 minutes, the DVD video player will automatically turn itself off.

Notes
- Do not move the DVD video player during playback. Doing so may damage the disc.
- Use the OPEN/CLOSE button to open and close the disc tray. Do not push the disc tray while it is moving. Doing so may cause the DVD video player to malfunction.
- Do not push up on the disc tray or put any objects other than discs on the disc tray. Doing so may cause the DVD video player to malfunction.
- In many instances, a menu screen will appear after playback of a movie is completed. Prolonged display of an on-screen menu may damage your television set, permanently etching that image onto its screen. To avoid this, be sure to press the STOP button on your remote control once the movie is completed.

Variable Speed Playback

You can play discs at various speeds, and resume playback from the location where you stopped playback.



DVD VCD CD Playing in fast reverse or fast forward directions

Press REV or FWD during playback.

REV FWD

REV: Fast reverse playback
FWD: Fast forward playback

Each time you press the REV or FWD button, the playback speed changes.

■ **To resume normal playback**

Press **PLAY**.

PLAY

Notes

- The DVD video player mutes sound and omits subtitles during reverse and forward scan of DVD video discs. However, the DVD video player plays sound during fast forward or fast reverse play of audio CDs.
- The playback speed may differ depending on the disc.

DVD VCD Playing in slow-motion

Press SLOW during playback.

SLOW

Each time you press the SLOW button, the slow-motion speed changes.

■ **To resume normal playback**

Press **PLAY**.

PLAY

Note

The sound is muted during slow-motion playback.

DVD VCD Playing frame by frame

Press PAUSE/STEP during still playback.

PAUSE/STEP

Each time you press the PAUSE/STEP button, the picture advances one frame.

■ **To resume normal playback**

Press **PLAY**.

PLAY

Note

The sound is muted during frame by frame playback.

DVD VCD CD Resuming playback from the same location

1 Press STOP at the location where you want to interrupt playback.

STOP

The DVD video player memorizes the location where playback is stopped.

2 Press PLAY.

PLAY

The DVD video player resumes playback from the location where you stopped playback.

■ **To start playback from the beginning regardless of the location where you stopped playback**

1 Press **STOP** twice.

STOP

The DVD video player effaces the memory of the location.

2 Press **PLAY**.

PLAY

DVD Playback starts from the beginning of the current title.

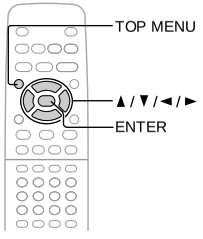
VCD CD Playback starts from the beginning of the disc.

- If you want to return to the beginning of a DVD video disc, open and close the disc tray once with the OPEN/CLOSE button before pressing the PLAY button.

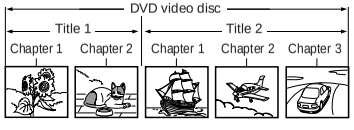
Notes

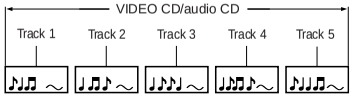
- Resuming cannot function when:
  - you change the parental lock setting 53 or select a disc menu language 51.
  - you play a PBC-featured VIDEO CD while "PBC" 55 is set to "On".
  - you open the disc tray.
- There may be a difference in the location where playback resumes depending on the disc.
- Settings you changed using the on-screen displays while the DVD video player keeps a location in the memory may function only after the memory is cleared.

Locating a Desired Section



Normally, DVD video discs are divided into titles, and the titles are sub-divided into chapters. VIDEO CDs and audio CDs are divided into tracks. You can quickly locate any specific title, chapter, or track.





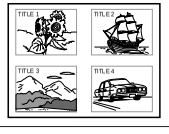
DVD Locating a title using the top menu

1 Press TOP MENU.

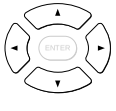
TOP MENU

The top menu appears on the TV screen.

e.g.



2 Press ▲/▼/◄/► to select the title you want.



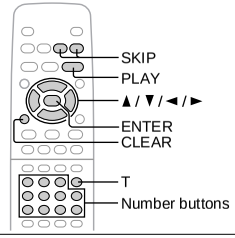
If the titles in the top menu are assigned a number, you can directly locate a specific title by pressing its designated number with the number buttons.

3 Press ENTER.

Playback starts from chapter 1 of the selected title.

Notes

- The instructions above describe basic procedures which may vary depending on the contents of the DVD video disc. If different instructions appear on the TV screen, follow those instructions.
- If you display the top menu during playback and press the TOP MENU button again without selecting any title, the DVD video player may resume playback from the point where you first pressed the TOP MENU button (depending on the actual DVD video disc.)
- This method of locating a title is available only on a disc that contains a top menu.
- Instruction notes of discs may refer to the button that displays the top menu as TITLE button.



DVD VCD CD Locating a desired section by entering the corresponding number

1 Press T.

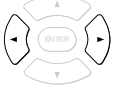
If you are using a VIDEO CD/audio CD, skip step 2. Then at step 3, enter the number for the track you want using the number buttons.

SEARCH

T

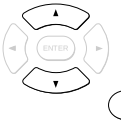
e.g.

2 Press ◄/► to select a section you want to locate.



e.g. When you want to locate a chapter.

3 Press ▲/▼ to enter a number of the section.



Also the number buttons are available.

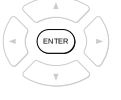
e.g. To enter 25

2 → 5 or +10 → +10 → 5

4 Repeat steps 2 and 3 if necessary.

5 Press PLAY or ENTER.

PLAY



Playback starts from the selected section.

Notes

- Pressing the CLEAR button resets the numbers. To clear the display, press the T button several times.
- This method of locating a title is available only on a disc that contains title numbers.

DVD VCD CD Locating a specific chapter or track

Press SKIP ⏮ or ⏭ repeatedly to display the chapter or track number you want.

Playback starts from the selected chapter or track.

SKIP ⏭

To locate succeeding chapters or tracks.

SKIP ⏮

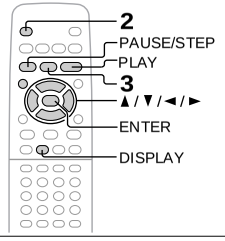
Playback starts from the beginning of the current chapter or track.
When you press twice, playback starts from the beginning of the preceding chapter or track.

Notes

- Some titles may not display chapter numbers.
- If you press and hold the SKIP ⏮ or ⏭ button on the front panel during playback, the DVD video player performs fast reverse or fast forward playback. You can vary the speed by pressing the button repeatedly.
  To locate chapters or tracks during fast reverse or fast forward playback, first press the PLAY button to resume normal playback, then use the SKIP ⏮ or ⏭ button.
- When you set "Title Stop" to "Off" (55), you can access chapters in another title. If you go back to the preceding title by pressing the SKIP ⏮ button, the DVD video player locates the first chapter of the title. When "Title Stop" is set to "On," you can access chapters only within the current title.

Playing an MP3 Encoded CD

You can play MP3 files on this DVD video player.



Playing an MP3 encoded CD

MP3 disc compatible with this player is limited as follows:
- Playable discs: CD-ROM, CD-R (650MB / 74 min. only)
  * CD-RW is not recommendable.
- Sampling Frequency: 44.1 kHz only
- Bit rate: 32 kbps-320 kbps
- CD physical format: Mode 1, Mode 2 XA Form 1
- File system: ISO9660 Level 1
- File names are limited to eight characters or less and must incorporate “MP3” extension.
  e.g.“********.MP3”
- File names cannot contain special characters such as “?!><+*}{`[@]:;\ /.,” etc.
- Total number of files on the disc should not exceed 254.

1 **Place a CD that contains MP3 files on the disc tray.**

2 **Press OPEN/CLOSE to load the disc.**

▲ OPEN/CLOSE

Playback starts.

3 **To stop playback, press STOP.**

STOP ■

Notes
- Some discs may not permit this operation.
- If you stop playback by pressing the STOP button, and then press the PLAY button, playback will start from the beginning of the track.
- The SKIP 31, REPEAT 35 and RANDOM 37 functions are also available.

■ To pause playback

Press **PAUSE/STEP** during playback.

PAUSE/STEP ⏸/⏯

To resume normal playback, press the PLAY button.

■ Selecting a track (file) in the disc

1. Press the DISPLAY button.
2. Select the MP3 icon using the ◄/► buttons then press the ENTER button.
   A list of tracks appears.
3. Press the ▲/▼/◄/► buttons to select a track you want to play.
   The current track being played is highlighted in green.
4. Press the ENTER button to begin playback of the selected track.

This DVD video player requires discs/recordings to meet certain technical standards in order to achieve optimal playback quality. Pre-recorded DVDs are automatically set to these standards. There are many different types of recordable disc formats (including CD-R containing MP3 files). Given the fact that technology in this area is still maturing, Toshiba cannot guarantee that all genre of recordable discs will produce optimal playback quality. The technical criteria set out in this owner's manual are meant as a guide only.

Customers should also note that permission is required in order to download MP3 files and music from the internet. Toshiba has no right to grant such permission. Permission should always be sought from the copyright owner.

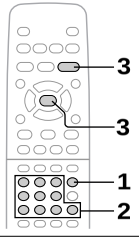
Advanced playback

Customizing the performance of your DVD video player.

- Accessing a Specific Location Directly
- Playing Repeatedly
- Playing in a Favorite Order
- Playing in Random Order
- Zooming a Picture
- Selecting the Picture Enhancement (E.P.M.)
- Selecting the Sound Enhancement (E.A.M.)
- Selecting the Camera Angle
- Selecting Subtitles
- Selecting a Language
- Operating in the On-screen Display Mode

Accessing a Specific Location Directly

You can access a specific location by entering its corresponding time (hours, minutes, seconds).



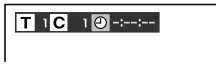
Entering the time of the desired location

1 Press T several times.

SEARCH (T)

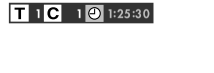
You may have to press further depending on the disc. Press the button repeatedly until the clock icon is highlighted.

e.g.



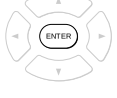
2 Press the number buttons to enter the time.

e.g. (1) → (2) → (5) → (3) → (0)



3 Press PLAY or ENTER.

PLAY (►)



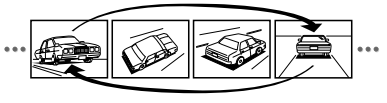
Playback starts from the desired location.

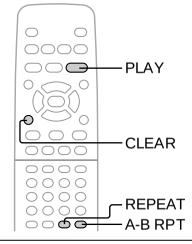
Notes

- Some discs may not respond to this process.
- Some scenes may not be located precisely as you specified.
- This method for accessing specific locations is available only within the current title of the DVD video disc or within the current track of the VIDEO CD/audio CD.

Playing Repeatedly

You can play a specific title, chapter, track, or segment repeatedly. (Title repeat, chapter/track repeat, A-B repeat)



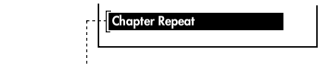


Repeating a title, chapter, or track

1 Press REPEAT.

REPEAT

Each time you press the REPEAT button, the repeat mode changes as follows.



DVD	Chapter Repeat	Repeats the current chapter.
DVD	Title Repeat	Repeats the current title.
VCD CD	Track Repeat	Repeats the current track.
DVD VCD CD	All Repeat	Repeats the entire disc.
	Repeat Off	Resumes normal playback.

2 Press PLAY.

PLAY (►)

The DVD video player starts repeat playback.
Press the PLAY button within about 5 seconds after you press the REPEAT button.

■ To resume normal playback

Press **CLEAR**.

CLEAR (−)

Note

Some discs may not permit repeat operation.

Repeating a specific segment

1 Press A-B RPT at the beginning of the segment (point A) you want to play repeatedly.

A-B RPT

2 Press A-B RPT again at the end of the segment (point B).

A-B RPT

The DVD video player automatically returns to point A and starts repeat playback of the selected segment (A-B).

■ To resume normal playback

Press **CLEAR**.

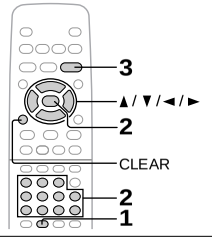
CLEAR (−)

Notes

- Some discs may not permit A-B repeat operation.
- You cannot set the A-B repeat function for a segment that includes multiple camera angles 41.
- You can specify a segment only within the current title or track (VIDEO CD).
- There may be a slight difference between point A and the location where playback actually resumes depending on the disc.

Playing in a Favorite Order

You can combine your favorite titles, chapters, or tracks and play them in the order you determine. You can program up to 30 selections into the memory. (Memory playback)



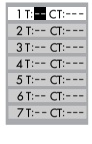
DVD VCD CD Setting titles, chapters, or tracks in a favorite order

1 Insert a disc and press MEMORY during stop.

MEMORY

The following display appears.

e.g.



T: Title number
CT: Chapter number or track number

2 Select the items in the order you want by pressing the number buttons, then ENTER for each item.

Each time you press the ◄/► button, the space of "T" and "CT" is highlighted in turn. Highlight where you want to enter, then press the corresponding number buttons.

To select another chapter in the same title, you do not need to select the title number.

To select tracks from a VIDEO CD/audio CD in order, press the **number buttons** for the track, then press the **ENTER** button for each selection you want.

Note
The space of "T (Title)" may be showing a number. Neglect this number when using a VIDEO CD/audio CD.

3 Press PLAY while the display appears on the TV screen.

PLAY ►

The DVD video player starts memory playback.

■ To change the programmed selections

1 While the display appears on the TV screen, press ▲/▼/◄/► to move the highlighted bar to the item you want to change.
2 Change the selection following the instructions in step **2**.

■ To cancel the programmed selections

1 While the display appears on the TV screen, press ▲/▼ to move the highlighted bar to the item you want to cancel.
2 Press **CLEAR**.

■ To resume normal playback from memory playback

Press **CLEAR**.

CLEAR

The memory playback indicator disappears.

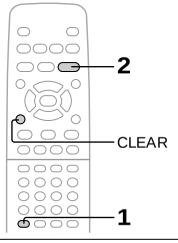
■ To program during playback

If you press the **MEMORY** button during playback, a programming display appears.
Follow steps **2** and **3**.

Notes
- Some discs may not permit memory playback operation.
- If you press the REPEAT button during memory playback, the DVD video player repeats the current memory playback.
- If you press the MEMORY or RETURN button while the display appears on the TV screen, the display disappears.
- The programmed selections will be cleared when you turn off the DVD video player.

Playing in Random Order

You can play titles, chapters within a title, or tracks in random order. (Random playback)



DVD VCD CD Playing titles, chapters or tracks in random order

1 Press RANDOM.

RANDOM

Each time you press the RANDOM button, the random playback mode changes as follows.

DVD Chapter Random — Plays chapters within the current title in random order.
↓
DVD Title Random — Plays titles in random order.
VCD CD Track Random — Plays tracks in random order.
↓
Random Off — Resumes normal playback.

If you press the RANDOM button during playback, the DVD video player automatically starts random playback after finishing the current title, chapter or track.

2 Press PLAY.

PLAY ►

The DVD video player starts random playback.
Press the PLAY button within about 5 seconds after you press the RANDOM button.

■ To resume normal playback

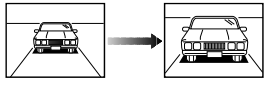
Press **CLEAR**.

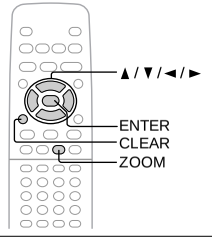
CLEAR

Notes
- Some discs may not permit random playback operation.
- You cannot use the random playback function in conjunction with the memory playback function.

Zooming a Picture

You can magnify areas within a picture.





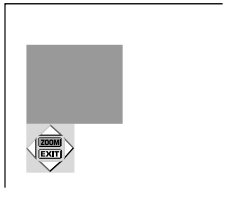
DVD Zooming a picture

Press ZOOM during normal, slow or still playback.

ZOOM

The DVD video player enters the zoom playback mode and displays the icon.

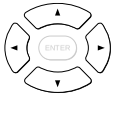
e.g.



ZOOM : As you repeatedly press the ENTER (or ZOOM) button while "ZOOM" is selected, the magnification level changes.
Variation of the levels includes reducing.

EXIT : If you press the ENTER button while "EXIT" is selected, you can turn off the icon, keeping the current magnification level.

You can shift the highlight within the icon by the ▲/▼/◄/► buttons.



If you press and hold the ▲/▼/◄/► buttons, the zoom point shifts.

CLEAR

Pressing the CLEAR button restores the zoom point to the center of the picture.

■ To resume normal playback

While "ZOOM" is selected, press **ZOOM** repeatedly to turn off the icon.
Picture restores the size when the icon disappears.

ZOOM

- The ENTER button cannot cancel zoom playback if you have turned off the icon by selecting "EXIT." To restore normal picture size, press the ZOOM button to display the icon, then further press the ZOOM button until the icon turns off.

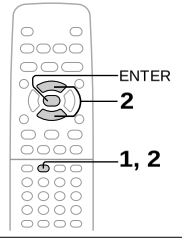
Notes

- Some discs may not respond to zoom feature.
- During some scenes, the buttons may not work as described.
- Zooming does not work on subtitles or menus included on DVD video discs.
- While the icon is displayed, the ▲/▼/◄/► buttons cannot work on menus included on DVD video discs. If you want to view the menus, turn off the icon.
- The magnification level varies depending on the picture size you select. 50

Selecting the Picture Enhancement (E.P.M.*)

You can easily switch the picture enhancement to your preference.

*E.P.M.: Enhanced Picture Mode

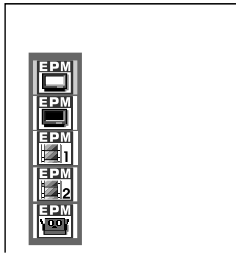


DVD VCD CD Selecting the picture enhancement

1 Press E.P.M.

E.P.M.

The picture enhancement selection appears.



2 Select the picture enhancement by pressing E.P.M. or ▲/▼.

Each time you press the button, the picture enhancement changes.

EPM — Light :
Brighter than in "Normal".

EPM — Normal:
Standard black level.

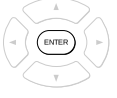
EPM 1 — Movie1:
To raise brightness to clarify details.

EPM 2 — Movie2:
To deepen colors.

EPM — Animation:
To raise contrast enhancing colors.

■ To turn off the picture enhancement selection

Press **ENTER**.



Alternatively leave the DVD video player unoperated for about 5 seconds after having made the selection.

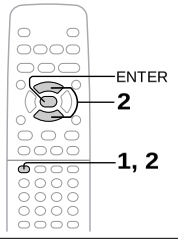
Note

Actual effects to pictures may vary depending on the TV.
Make the selection to your preference.

Selecting the Sound Enhancement (E.A.M.*)

You can easily switch the sound enhancement to your preference.

*E.A.M.: Enhanced Audio Mode

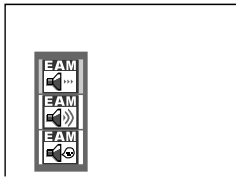


DVD VCD CD Selecting the sound enhancement

1 Press E.A.M.

E.A.M.

The sound enhancement selection appears.



2 Select the sound enhancement by pressing E.A.M. or ▲/▼.

Each time you press the button, the sound enhancement changes.

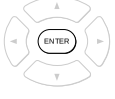
EAM Normal:
Normal sound.

EAM 3D:
To obtain expansive virtual surround sound effects from just two speakers.

EAM Dialogue:
To control dynamic range to make dialogue more intelligible (only when playing a DVD video disc recorded on the Dolby Digital recording system).
- To use this enhancement on sounds output from the BITSTREAM/PCM (DIGITAL) AUDIO OUT jack, be sure to set "Audio Out Select" to "PCM". 50

■ To turn off the audio enhancement selection

Press **ENTER**.



Alternatively leave the DVD video player unoperated for about 5 seconds after having made the selection.

Notes
- Actual effects to sounds may vary depending on the speakers. Make the selection to your preference.
- Actual effects to sounds may vary depending on the disc.
- When the DVD video player is connected to an amplifier equipped with Dolby Pro Logic Surround, select "Normal". Otherwise, Dolby Pro Logic Surround may function differently than usual.
- Selecting "Dialogue" disables "Dynamic Range Control" function 50.

Spatializer® 3-Dimensional Sound Processing provided by Desper Products. Inc.
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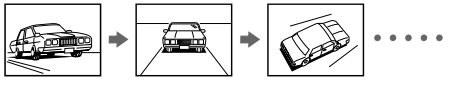
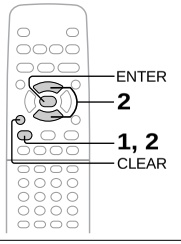
Selecting the Camera Angle

If the scene was recorded from multiple angles, you can easily change the camera angle of the scene you are watching.





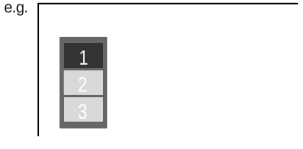
DVD Changing the camera angle

1 Press ANGLE while playing a scene recorded with multiple angles.

ANGLE

While playing a scene recorded with multiple angles, the angle icon (🎥) flashes in the DVD display.
Press the ANGLE button while the angle icon is flashing.

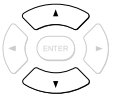
e.g.



2 Press ANGLE or ▲/▼ while the angle number is displayed on the TV screen.

ANGLE

Each time you press the ANGLE button, the camera angle changes.



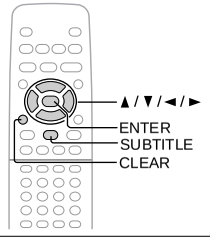
You can change the camera angle directly by pressing the number buttons corresponding to its angle number instead of using the ▲/▼ buttons.

To turn off the display, press the CLEAR or ENTER button.

Notes
- You can change the camera angle during still playback. The camera angle changes to the new setting when you resume normal playback.
- If you pause a picture immediately after changing a camera angle, the resumed playback picture may not display the new camera angle.

Selecting Subtitles

You can display subtitles on the TV screen and select a subtitle language from those included on the DVD video disc.



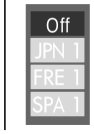
DVD Selecting a subtitle language

1 Press SUBTITLE during playback.

SUBTITLE

The current subtitle setting is displayed.

e.g.

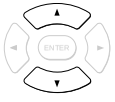


The abbreviation of the language appears instead of the language name. Refer to the list of languages and their abbreviations. 56

2 Press SUBTITLE or ▲/▼ while the subtitle setting is displayed on the TV screen.

SUBTITLE

Each time you press the SUBTITLE button, the subtitle languages included on the DVD video disc change.



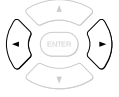
To turn off the subtitle setting display, press the CLEAR or ENTER button.

■ To turn subtitles on or off

1 Press **SUBTITLE** during playback.

SUBTITLE

2 Press ◄/► while the subtitle setting is displayed on the TV screen, to select “On” or “Off.”



Notes

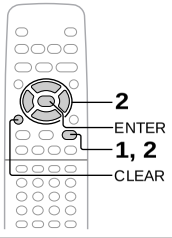
- Some DVD video discs are set to display subtitles automatically, and you cannot turn them off even if you set the subtitle function to off.
- During some scenes, the subtitles may not appear immediately after you select “On.”
- Some DVD video discs will allow you to make subtitle selections and turn subtitles on or off only via the disc menu.

Notes

- When you turn on the DVD video player or replace a disc, the player returns to the initial default setting 52. When you select a subtitle language which is not included on the disc, the DVD video player plays a prior language programmed on the disc.
- During some scenes, the subtitles may not appear immediately after you change the subtitle language.

Selecting a Language

You can select a preferred language and sound recording system from those included on the DVD video disc.



DVD VCD Selecting a playback audio setting

1 Press AUDIO during playback.

AUDIO

The current audio setting is displayed.

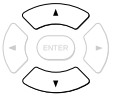
e.g.

The abbreviation of the language appears instead of the language name. Refer to the list of languages and their abbreviations. 56

2 Press AUDIO or ▲/▼ while the audio setting is displayed on the TV screen.

AUDIO

Each time you press the AUDIO button, the audio settings included on the DVD video disc change.



If you press the ◄/► buttons, you can select output sound format. 50

To turn off the audio setting display, press the CLEAR or ENTER button.

■ Selecting sound channels of VIDEO CDs

You can switch left and right channels by pressing the **AUDIO** button repeatedly during playback.

AUDIO

Notes

- When you turn on the DVD video player or replace a disc, player returns to the initial default setting 52. If you select a sound track which is not included on the disc, the DVD video player plays a prior sound track programmed on the disc.
- Some discs allow you to change audio selections only via the disc menu. If this is the case, press the MENU button and choose the appropriate language from the selections on the disc menu.

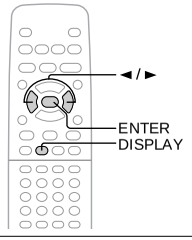
■ Output sound conversion table (sampling frequency/quantization bit)

Discs	Recording system		Audio selection from the menu 48 50 and output jacks on the rear panel					
			“Bitstream”		“Analog 2ch”		“PCM”	
			BITSTREAM/PCM jack	ANALOG AUDIO OUT jacks	BITSTREAM/PCM jack	ANALOG AUDIO OUT jacks	BITSTREAM/PCM jack	ANALOG AUDIO OUT jacks
DVD video discs	Dolby Digital		Bitstream	48 kHz/20 bit	Bitstream	48 kHz/20 bit	48 kHz/16 bit	48 kHz/20 bit
	Linear PCM	48 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit
		48 kHz/20 bit	48 kHz/16 bit	48 kHz/20 bit	48 kHz/16 bit	48 kHz/20 bit	48 kHz/16 bit	48 kHz/20 bit
		48 kHz/24 bit	48 kHz/16 bit	48 kHz/24 bit	48 kHz/16 bit	48 kHz/24 bit	48 kHz/16 bit	48 kHz/24 bit
		96 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit	—	96 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit
		96 kHz/20 bit	48 kHz/16 bit	48 kHz/20 bit	—	96 kHz/20 bit	48 kHz/16 bit	48 kHz/20 bit
		96 kHz/24 bit	48 kHz/16 bit	48 kHz/24 bit	—	96 kHz/24 bit	48 kHz/16 bit	48 kHz/24 bit
	DTS		Bitstream	—	Bitstream	—	—	—
	MPEG1, MPEG2		Bitstream	48 kHz/16 bit	Bitstream	48 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit
VIDEO CDs	MPEG1		44.1 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit
Audio CDs	Linear PCM 44.1 kHz/16 bit		44.1 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit
	DTS		Bitstream	(Noise)	Bitstream	(Noise)	Bitstream	(Noise)

: 3D sound enhancement can function.

Operating in the On-screen Display Mode

When you turn on the on-screen display, you can view information on operational status and access the features and settings on-screen.



DVD VCD CD Operating in the on-screen display mode

Press DISPLAY.

DISPLAY

The following display appears.
Each time you press the DISPLAY button, the on-screen display changes as follows.
If you press the ◄/► buttons to select an icon, then press the ENTER button, you can access the feature.
When you select an icon (*), no need to press the ENTER button.
See the pages in ▭ for details on the features.

e.g. When playing a DVD video disc

T * : Title number (Track number)
To locate a title or track using the number. 31

C * : Chapter number
To locate a chapter using the number. 31

* : Elapsed time of the current title
To enter the time to locate a desired location. 34

: Audio setting 43

: Subtitle setting 42

: Angle setting 41

: To turn off the display.

Press DISPLAY again.

T * : Title number (Track number)
To locate a title or track using the number. 31

C * : Chapter number
To locate a chapter using the number. 31

* : Remaining time of the current title
To enter the time to locate a desired location. 34

: E.A.M. (Enhanced Audio Mode) setting 40

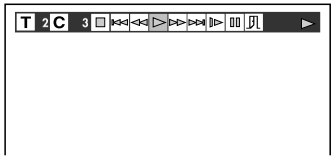
: E.P.M. (Enhanced Picture Mode) setting 39

: To zoom a picture. 38

: "Audio Out Select" setting 50
BST: Bitstream 2CH: Analog 2ch PCM: PCM

: To turn off the display.

Press DISPLAY again.



T * : Title number (Track number)
To locate a title or track using the number. 31

C * : Chapter number
To locate a chapter using the number. 31

: To stop playback. 27

: Playback starts from the beginning of the current chapter or track. 31

: Fast reverse playback 28

: To start playback. 26

: Fast forward playback 28

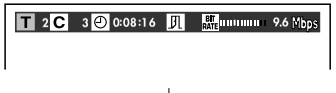
: To locate succeeding chapters or tracks. 31

: To slow motion playback. 29

: To pause playback. 27

: To turn off the display.

Press DISPLAY again.



OFF

To turn off the on-screen display, press DISPLAY again.

The on-screen display will vary depending on the disc.

DVD : Data transfer rate (Mbit/s)
= Amount of picture, sound and subtitle data in the DVD video disc transferred per second.
The larger the value is, the more data processed, but this does not necessarily insure better picture quality.

CD : CD-Text
Displays CD-Text data if included on the audio CDs. (Some letters may not be displayed properly depending on the disc.)

VCD : The on-screen display turns off.

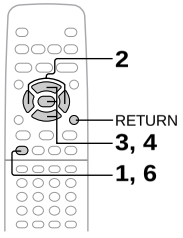
Function Setup

You can change the default settings to customize performance to your preference.

- **Customizing the Function Settings**
- **Table of Languages**

Customizing the Function Settings

You can change the default settings to customize performance to your preference.

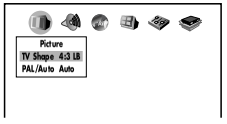


Setting procedure

1 Press SETUP during stop.

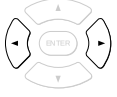
SETUP

The following on-screen display appears.



2 Press ◄/► to select a symbol for the setting you want to change.

(See the next page.)



Picture performance settings

Output sound settings

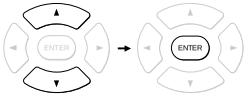
Language settings

Display settings

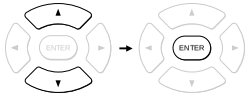
Operational settings

Initial settings

3 Press ▲/▼ to select the setting you want to change, then press ENTER.



4 Change the selection by ▲/▼ or other buttons, by referring to the corresponding pages (50 –), then press ENTER.



5 Repeat steps 3 and 4 to change other settings.

To select another operation, go back to step 2.

6 Press SETUP.

SETUP

The on-screen display disappears.

■ **To return to the previous display**

Press **RETURN**.

RETURN

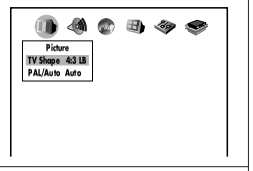
Notes

- The on-screen display disappears when you press the SETUP button.
- The SETUP button can function even during normal playback, however some operations may be inaccessible, and a message will appear. In this case, try again after playback is stopped.

Setting		Details	Page
TV Shape	DVD	**To select a picture size according to the aspect ratio of your TV.**	**50**
PAL/Auto	DVD VCD	**To select to the video system of a disc.**	**50**
Audio Out Select	DVD VCD CD	**To select an output sound format corresponding to your system connection.**	**50**
Dynamic Range Control	DVD	**To turn on or off a function that makes faint sounds easier to hear even if you lower the volume during late hours playback.**	**50**
Karaoke Vocal	DVD	**To turn on or off the vocal output during DVD KARAOKE disc playback.**	**51**
On-Screen Language	DVD VCD CD	**To select a preferred language for on-screen displays.**	**51**
Disc Menu Language	DVD	**To select a preferred language for disc menus.**	**51**
Audio Language	DVD	**To select a preferred language for the sound track.**	**52**
Subtitle Language	DVD	**To select a preferred language for subtitles.**	**52**
On-Screen Displays	DVD VCD CD	**To turn on or de-activate the operational status display on the TV screen.**	**53**
Background	DVD VCD CD	**To select the background color or background picture.**	**53**
Screen Saver	DVD	**To turn the screen saver on or off.**	**53**
Pause/Still	DVD	**To select the resolution of still pictures. (Field/Frame)**	**53**
Parental Lock	DVD	**To turn the parental lock function on or off.**	**53**
Title Stop	DVD	**To turn on or off a feature that automatically stops playback after a title has been viewed.**	**55**
PBC	VCD	**To use the menu screen when playing a PBC-controllable VIDEO CD.**	**55**
On-Screen Language TV Shape Audio Out Select	DVD VCD CD	**To install the initial system setting.**	**55**

Customizing the Function Settings (continued)

Setting details



TV Shape (DVD)

4:3 Letterbox: Select when a standard 4:3 TV is connected.
Displays theatrical images with masking bars above and below the picture.

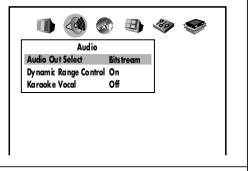
4:3 Normal: Select when a standard 4:3 TV is connected.
Displays pictures cropped to fill your TV screen. Either or both sides of the picture are cut off.

16:9 Widescreen: Select when a 16:9 wide TV is connected.

Notes
- The displayable picture size is preset on the DVD video disc. Therefore, the playback picture of some DVD video discs may not conform to the picture size you select.
- When you play DVD video discs recorded in the 4:3 picture size only, the playback picture always appears in the 4:3 picture size regardless of the TV shape setting.
- If you select "16:9 Widescreen" and you own a 4:3 TV set, the DVD playback picture will be horizontally distorted during playback. Images will appear to be horizontally compressed. Always be sure that your TV shape conforms to the actual TV in use.

PAL/Auto (DVD) (VCD)

PAL: To play a PAL disc. Connect a PAL TV to view a picture.
Auto: The DVD video player automatically identifies PAL or NTSC video system of a disc. Connect a multisystem TV (PAL/NTSC compatible) to view a picture.
A playback picture may be distorted when detected a signal change between PAL and NTSC on the disc.



Audio Out Select (DVD) (VCD) (CD)

Select the output sound format corresponding to your system connection.
For details of sound recording systems, see 43.

Bitstream: Select when connected to an amplifier equipped with a Dolby Digital, DTS, MPEG1 or MPEG2 decoder. 21 22
The DVD video player outputs digital audio information in the bitstream format when you play a DVD video disc recorded on the Dolby Digital, DTS, MPEG1 or MPEG2 recording system.

Analog 2ch: Select when connected to a TV, or Dolby Pro Logic or stereo system via the analog audio jacks. 18 19 21

PCM: Select when connected to a 2 channel digital stereo amplifier. 23
The DVD video player outputs sounds in the PCM 2ch format when you play a DVD video disc recorded on the Dolby Digital, MPEG1 or MPEG2 recording system.

Dynamic Range Control (DVD)

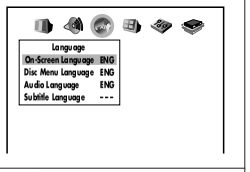
Off: Full dynamic range is maintained.
On: Dynamic range is reduced.

Notes
- This function works only during playback of Dolby Digital recorded discs.
- The level of Dynamic Range Reduction may differ depending on the DVD video disc.

Karaoke Vocal (DVD)

Off: The primary vocal is not output.
On: The primary vocal is output when it is recorded on the disc.

Notes
- The vocal output feature is used during playback of Dolby Digital (multi-channel) recorded DVD KARAOKE discs. This feature allows you to turn off vocal audio tracks, or restore them for background accompaniment.
- When playing KARAOKE, connect appropriate audio equipment such as an amplifier to the DVD video player.



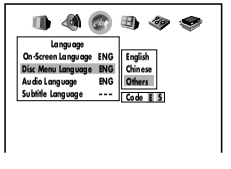
On-Screen Language (DVD) (VCD) (CD)

English: To view on-screen displays in English.
中国语: To view on-screen displays in Chinese.

Disc Menu Language (DVD)

English: To display disc menus in English.
Chinese: To display disc menus in Chinese.
Others: To make a further choice.
After pressing the ENTER button, follow steps 1) - 4) below.

1) Obtain the abbreviation of the preferred language from the list 56.
2) Select the first character by pressing the ▲/▼ buttons.
3) Press the ◄/► buttons to shift and select the second character by pressing the ▲/▼ buttons.



4) Press the ENTER button.

Note
Some DVD video discs may not include your pre-selected language. In this case, the DVD video player automatically displays disc menus consistent with the disc's initial language setting.

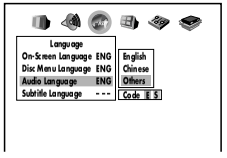
Customizing the Function Settings (continued)

Setting details

Audio Language (DVD)

English: To play sound tracks in English.
Chinese: To play sound tracks in Chinese.
Others: To make a further choice.
After pressing the ENTER button, follow steps 1) - 4) below.

1) Obtain the abbreviation of the preferred language from the list 56.
2) Select the first character by pressing the ▲/▼ buttons.
3) Press the ◄/► buttons to shift and select the second character by pressing the ▲/▼ buttons.



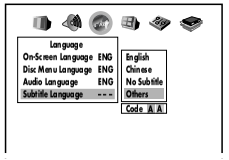
4) Press the ENTER button.

Note
Some DVD video discs may be played in a different language than you selected. A prior language may be programmed on the disc.

Subtitle Language (DVD)

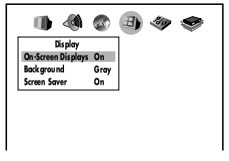
English: To display subtitles in English.
Chinese: To display subtitles in Chinese.
No Subtitle: To disable subtitles.
Others: To make a further choice.
After pressing the ENTER button, follow steps 1) - 4) below.

1) Obtain the abbreviation of the preferred language from the list 56.
2) Select the first character by pressing the ▲/▼ buttons.
3) Press the ◄/► buttons to shift and select the second character by pressing the ▲/▼ buttons.



4) Press the ENTER button.

Notes
- Some DVD video discs may be set to display subtitles in a different language than you selected. A prior subtitle language may be programmed on the disc.
- Some DVD video discs allow you to change subtitle selections only via the disc menu. If this is the case, press the MENU button and choose the appropriate subtitle language from the selection on the disc menu.



On-Screen Displays (DVD) (VCD) (CD)

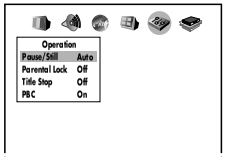
Off: Operational modes (e.g. "▯▯", "▷▷") are not displayed.
On: Operational modes (e.g. "▯▯", "▷▷") are displayed on-screen.

Background (DVD) (VCD) (CD)

Blue: Blue background.
Gray: Gray background.
Picture: To use the picture which appears when you turn on the DVD video player as a background.
Jacket: To use the jacket picture included on some discs as a background. If it is not included, a gray background will be substituted.

Screen Saver (DVD)

Off: The screen saver is disengaged.
On: The screen saver operates.



Pause/Still (DVD)

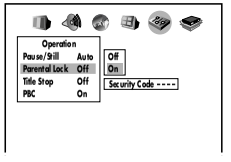
Auto: For normal use. Still and fast motion images can be paused.
Frame: The resolution of still pictures is improved, so that you can make a motionless picture more clearer when you pause it.

Parental Lock (DVD)

DVD video discs equipped with the parental lock function are rated according to their content. The contents allowed by a parental lock level and the way a DVD video disc can be controlled may vary from disc to disc. For example, if the disc allowed you could edit out violent scenes unsuitable for children and replace them with more suitable scenes, or lock out playback of the disc altogether.

- DVD video discs may or may not respond to the parental lock settings. This is not a defect in the DVD video player. Make sure this function works with your DVD video discs.

Off: The parental lock feature does not function.
After pressing the ENTER button, follow step 1) below.
On: To activate the parental lock feature or change the settings.
After pressing the ENTER button, follow steps 1) - 3) below.



(Continued)

Customizing the Function Settings (continued)

Setting details

(Continued)

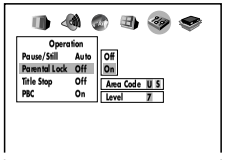
1) Press the number buttons to create a personal 4-digit security code, then press the ENTER button.
If you make a mistake before pressing the ENTER button, press the CLEAR button and enter your 4-digit security code again.

2) Enter the code of a country/area whose standards were used to rate the DVD video disc, referring to the list below.

Country/Area	Code
AUSTRALIA	AU
BELGIUM	BE
CANADA	CA
CHINA	CN
CHINA HONG KONG	HK
DENMARK	DK
FINLAND	FI
FRANCE	FR
GERMANY	DE
INDONESIA	ID
ITALY	IT
JAPAN	JP
MALAYSIA	MY
NETHERLANDS	NL
NORWAY	NO
PHILIPPINES	PH
RUSSIAN FEDERATION	RU
SINGAPORE	SG
SPAIN	ES
SWEDEN	SE
SWITZERLAND	CH
THAILAND	TH
UNITED KINGDOM	GB
UNITED STATES	US

a) Select the first character by pressing the ▲/▼ buttons.
b) Press the ◄/► buttons to shift and select the second character by pressing the ▲/▼ buttons.
c) Press the ENTER button.

3) Press the ▲/▼ buttons to select the parental lock level, then press the ENTER button.



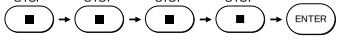
You cannot play DVD video discs rated higher than the level you selected unless you cancel the parental lock function.
For example, when you select level 7, discs rated higher than level 7 are locked out and cannot be played.

The parental lock level is equivalent to the following USA movie ratings.
Level 7: NC-17
Level 6: R
Level 4: PG 13
Level 3: PG
Level 1: G

The parental lock levels for other countries/areas than U.S. are included for future use. Check the appropriate parental lock level when you buy a DVD video disc equipped with the parental lock feature in the future.

■ **To change the parental lock level**
Follow steps 1) - 3).

■ **To change your 4-digit security code**
1) After selecting “On” or “Off,” press the STOP button four times, then press the ENTER button.



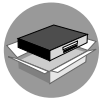
The 4-digit security code is cleared.
2) Press the number buttons to create a new 4-digit security code.
3) Press the ENTER button.

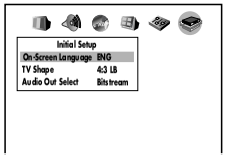
Title Stop (DVD)

Off: The DVD video player continues after playback of a title is completed.
On: The DVD video player stops after playback of a title is completed.

PBC (VCD)

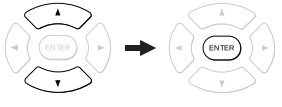
Off: When playing a VIDEO CD without using the menu.
On: To use the menu when playing a PBC-featured VIDEO CD.





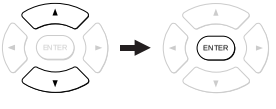
Initial Setup (DVD) (VCD) (CD)

1) Press the ▲/▼ buttons to select “On-Screen Language,” and press the **ENTER** button.



2) Select a language pressing the ▲/▼ buttons, and press the **ENTER** button.

See page 51, “On-Screen Language.”



3) Make your selection in the same manner as step 1) then step 2).

See page 50, “TV Shape.”
See page 50, “Audio Out Select.”

Table of Languages

Table of languages and their abbreviations

Abbreviation	Language
– – –	No alternate language
CHI (ZH)	Chinese
DUT (NL)	Dutch
ENG (EN)	English
FRE (FR)	French
GER (DE)	German
ITA (IT)	Italian
JPN (JA)	Japanese
KOR (KO)	Korean
MAY (MS)	Malay
SPA (ES)	Spanish
AA	Afar
AB	Abkhazian
AF	Afrikaans
AM	Amharic
AR	Arabic
AS	Assamese
AY	Aymara
AZ	Azerbaijani
BA	Bashkir
BE	Belorussian
BG	Bulgarian
BH	Bihari
BI	Bislama
BN	Bengali, Bangla
BO	Tibetan
BR	Breton
CA	Catalan
CO	Corsican
CS	Czech
CY	Welsh
DA	Danish
DZ	Bhutani
EL	Greek
EO	Esperanto
ET	Estonian
EU	Basque
FA	Persian
FI	Finnish
FJ	Fiji
FO	Faroese
FY	Frisian
GA	Irish
GD	Scottish Gaelic
GL	Galician

Abbreviation	Language
GN	Guarani
GU	Gujarati
HA	Hausa
HI	Hindi
HR	Croatian
HU	Hungarian
HY	Armenian
IA	Interlingua
IE	Interlingue
IK	Inupiak
IN	Indonesian
IS	Icelandic
IW	Hebrew
JI	Yiddish
JW	Javanese
KA	Georgian
KK	Kazakh
KL	Greenlandic
KM	Cambodian
KN	Kannada
KS	Kashmiri
KU	Kurdish
KY	Kirghiz
LA	Latin
LN	Lingala
LO	Laotian
LT	Lithuanian
LV	Latvian, Lettish
MG	Malagasy
MI	Maori
MK	Macedonian
ML	Malayalam
MN	Mongolian
MO	Moldavian
MR	Marathi
MT	Maltese
MY	Burmese
NA	Nauru
NE	Nepali
NO	Norwegian
OC	Occitan
OM	(Afan) Oromo
OR	Oriya
PA	Panjabi
PL	Polish
PS	Pashto, Pushto

Abbreviation	Language
PT	Portuguese
QU	Quechua
RM	Rhaeto-Romance
RN	Kirundi
RO	Rumanian
RU	Russian
RW	Kinyarwanda
SA	Sanskrit
SD	Sindhi
SG	Sango
SH	Serbo-Croatian
SI	Singhalese
SK	Slovak
SL	Slovenian
SM	Samoan
SN	Shona
SO	Somali
SQ	Albanian
SR	Serbian
SS	Siswati
ST	Sesotho
SU	Sundanese
SV	Swedish
SW	Swahili
TA	Tamil
TE	Telugu
TG	Tajik
TH	Thai
TI	Tigrinya
TK	Turkmen
TL	Tagalog
TN	Setswana
TO	Tongan
TR	Turkish
TS	Tsonga
TT	Tatar
TW	Twi
UK	Ukrainian
UR	Urdu
UZ	Uzbek
VI	Vietnamese
VO	Volapük
WO	Wolof
XH	Xhosa
YO	Yoruba
ZU	Zulu

Others

● Before Calling Service Personnel
● Specifications

Before Calling Service Personnel

Check the following guide for the possible cause of a problem before contacting service.

Symptoms and correction

Symptom	Cause	Correction	Page
No power.	• The power plug is disconnected.	• Connect the power plug securely into the wall outlet.	18
The DVD video player turned off by itself.	• The automatic power off function turned the unit off.	• Press the PLAY button.	27
No picture.	• The TV is not set to receive DVD signal output.	• Select the appropriate video input mode on the TV so the picture from the DVD video player appears on the TV screen.	26
	• The video cable is not connected securely.	• Connect the video cable securely into the appropriate jacks.	18, 19
No sound.	• The equipment connected with the audio cable is not set to receive DVD signal output.	• Select the correct input mode of the audio receiver so you can listen to the sound from the DVD video player.	26
	• The audio cable is not connected securely.	• Connect the audio cable securely into the appropriate jacks.	18 – 23
	• The audio receiver or TV is turned off.	• Turn on the equipment connected with the audio cable.	26
	• The setting of output sound format is incorrect.	• Select the proper audio setting.	43, 48 50
The playback picture has occasional distortion.	• The disc is dirty.	• Eject the disc and clean it.	9
	• It is in fast forward or fast reverse playback.	• Sometimes a small amount of picture distortion may appear. This is not a malfunction.	–
Brightness is unstable or noises are present in the playback pictures.	• The effect of copy protection.	• Connect the DVD video player directly to the TV. Avoid connecting the DVD video player to a VTR or TV/VTR combination.	18
The DVD video player does not start playback.	• No disc is inserted.	• Insert a disc.	26
	• An unplayable disc is inserted.	• Insert a playable disc. (Check the disc type and color system.)	10
	• The disc is placed upside down.	• Place the disc with the playback side down.	26
	• The disc is not placed within the guide.	• Place the disc correctly inside the guide on the disc tray.	26
	• The disc is dirty.	• Clean the disc.	9
	• The parental lock function is set.	• Cancel the parental lock function or change the parental lock level.	48, 53
Playback does not follow the course of the disc's program.	• It is in the mode of repeat playback, memory playback, etc.	• These operations may prevent a proper progress of the contents.	–
Buttons do not work.	• Power supply fluctuations or other abnormalities such as static electricity may interrupt correct operations.	• Press and hold the ON/STANDBY button on the front panel for more than about 3 seconds. The DVD video player turns off. Press the button again to turn it on. If the buttons still do not work, disconnect the power plug and insert it into the wall outlet again.	–
The remote control does not work properly.	• The remote control is not pointed at the remote sensor of the DVD video player.	• Point the remote control at the remote sensor of the DVD video player.	15
	• The remote control is too far from the DVD video player.	• Operate the remote control within about 7 m.	15
	• The batteries in the remote control are exhausted.	• Replace the batteries with new ones.	15

2. LOCATION OF MAIN PARTS AND MECHANISM PARTS

2-1. Location of Main Parts

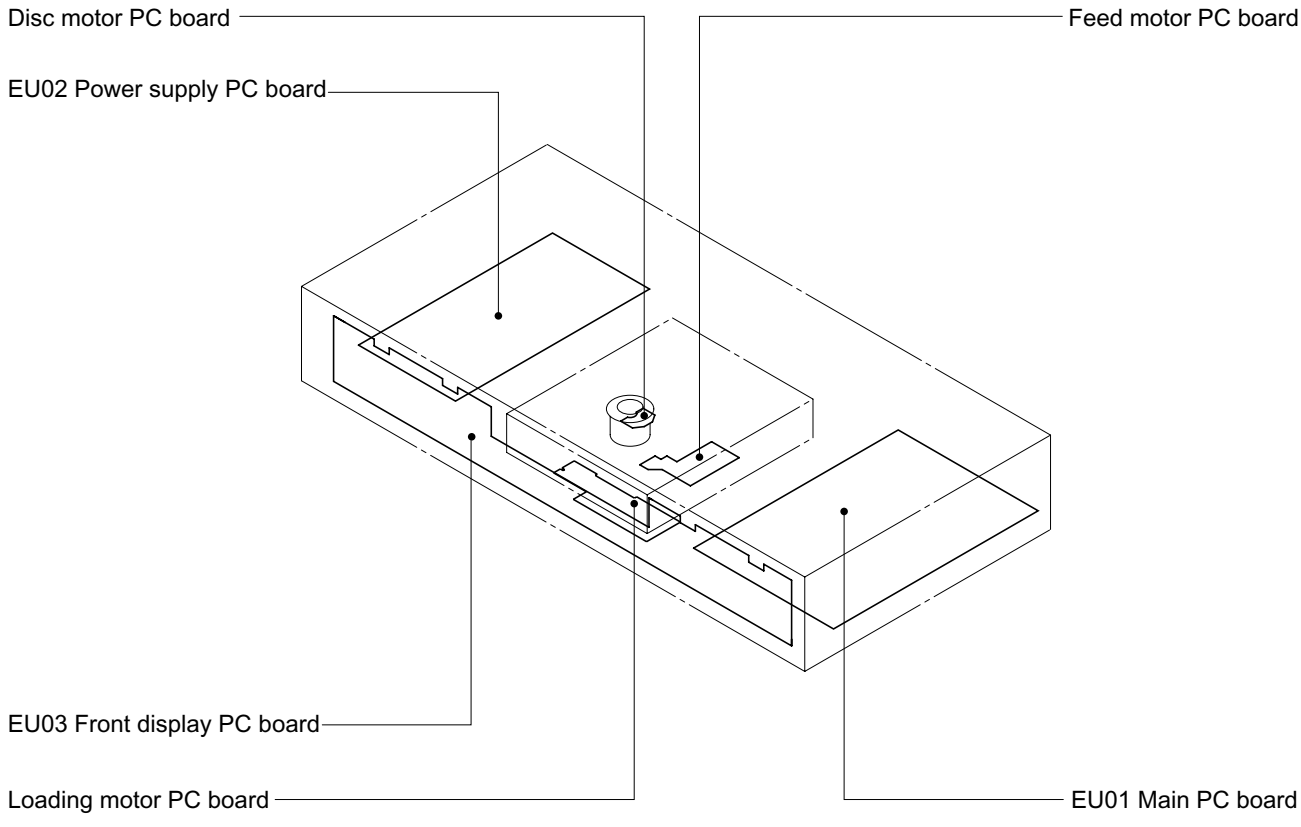

Disc motor PC board
Feed motor PC board
EU02 Power supply PC board
EU03 Front display PC board
Loading motor PC board
EU01 Main PC board

Fig. 1-2-1

2-2. Location of Mechanism Parts

2-2-1. Type A

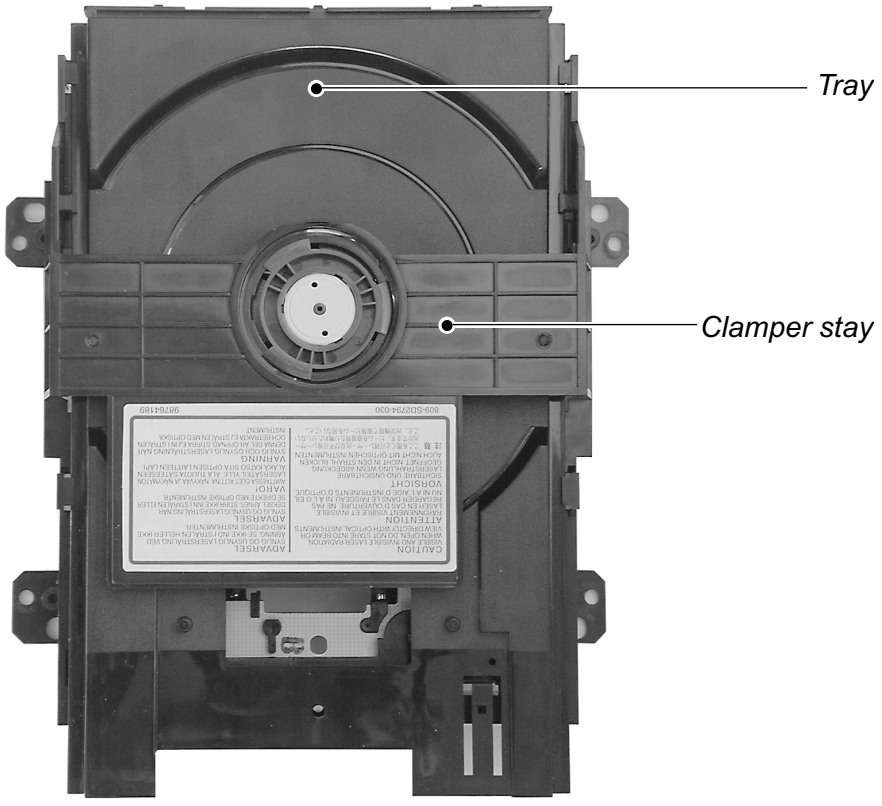


Fig. 1-2-2 Mechanism chassis assembly (Top side)

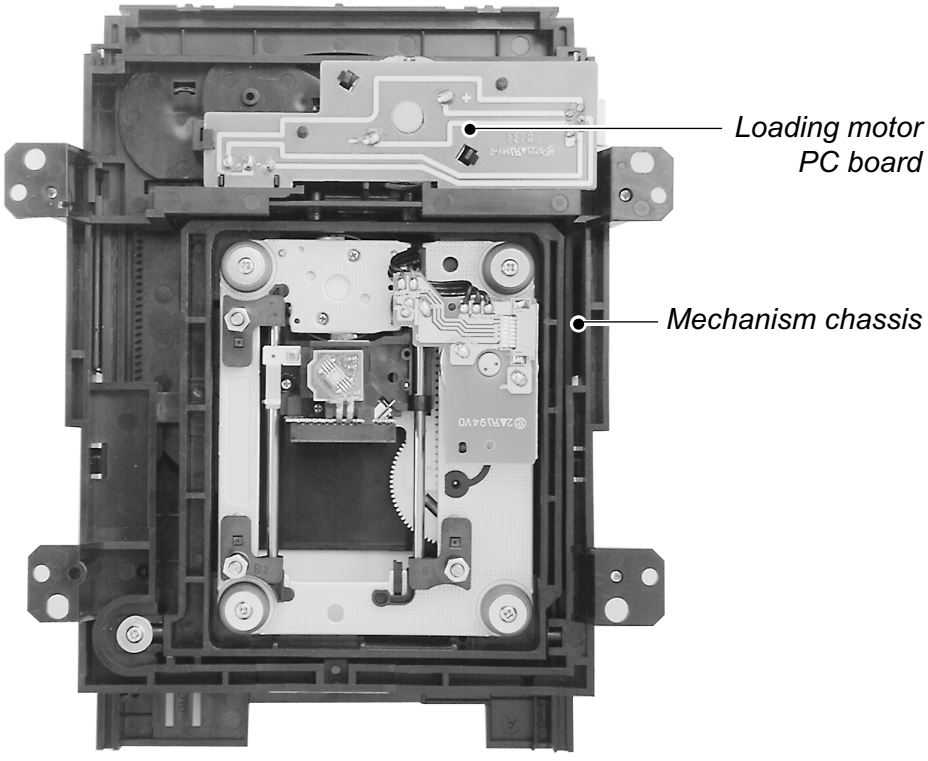


Fig. 1-2-3 Mechanism chassis assembly (Bottom side)

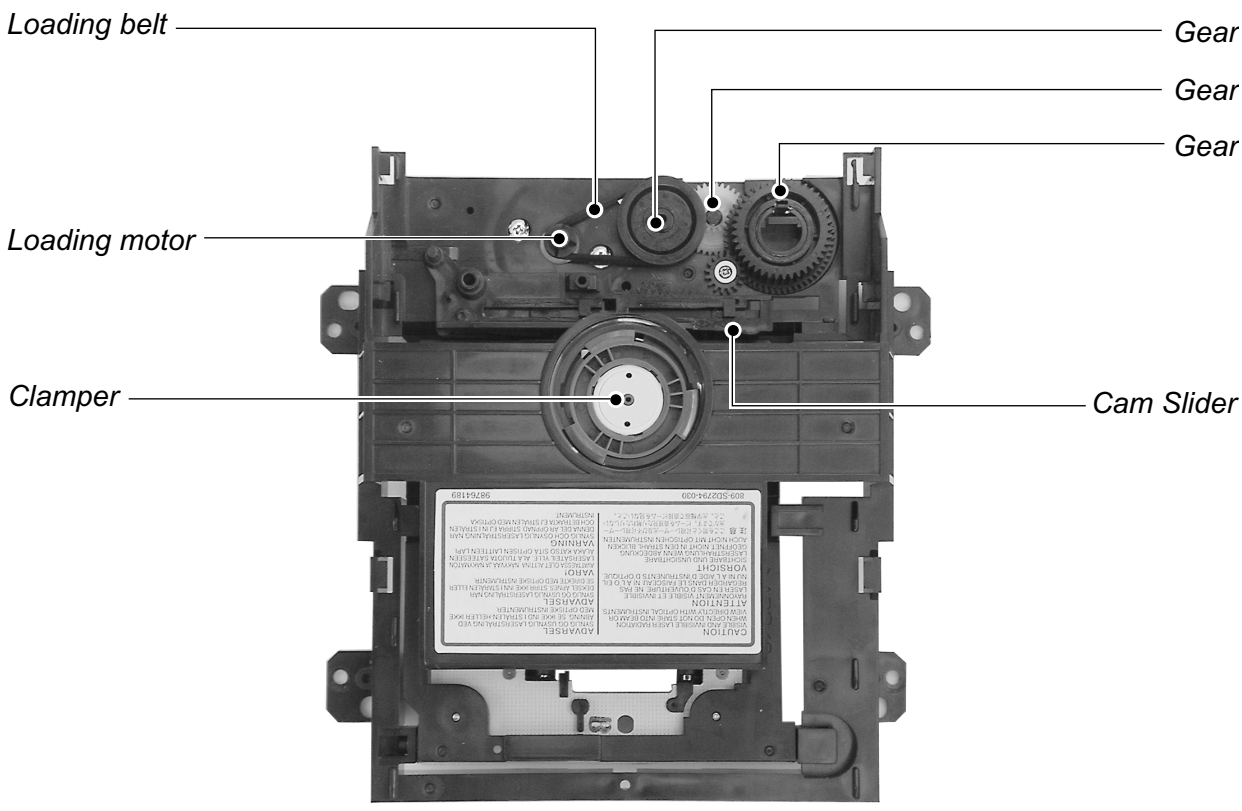


Fig. 1-2-4 Mechanism chassis assembly (Internal side)

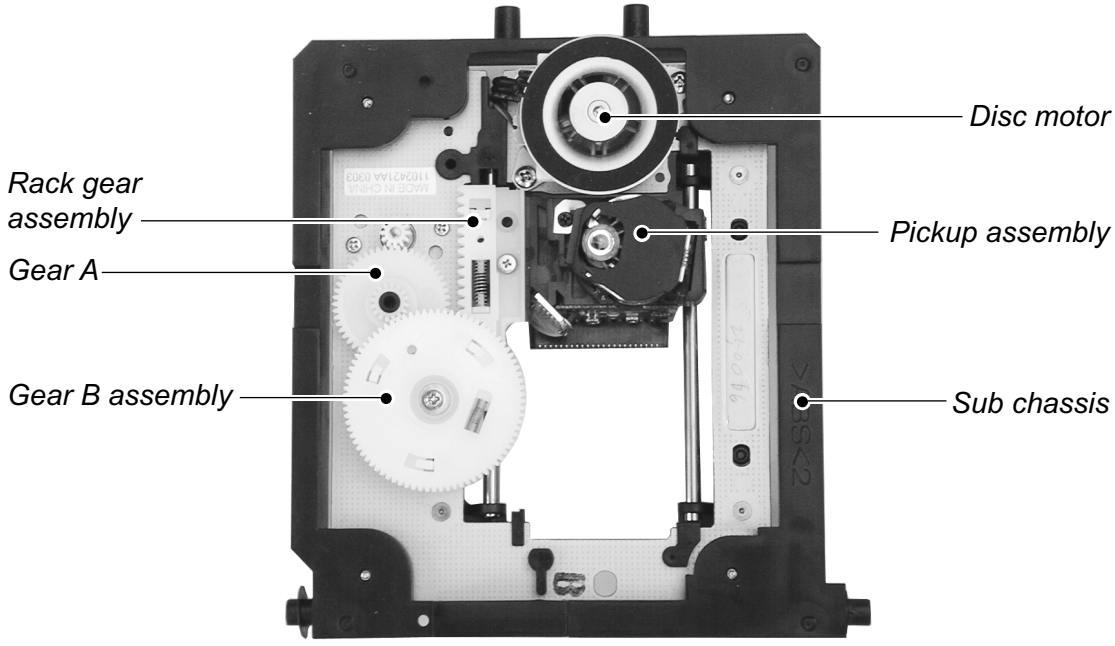


Fig. 1-2-5 Pickup mechanism chassis assembly (Top side)

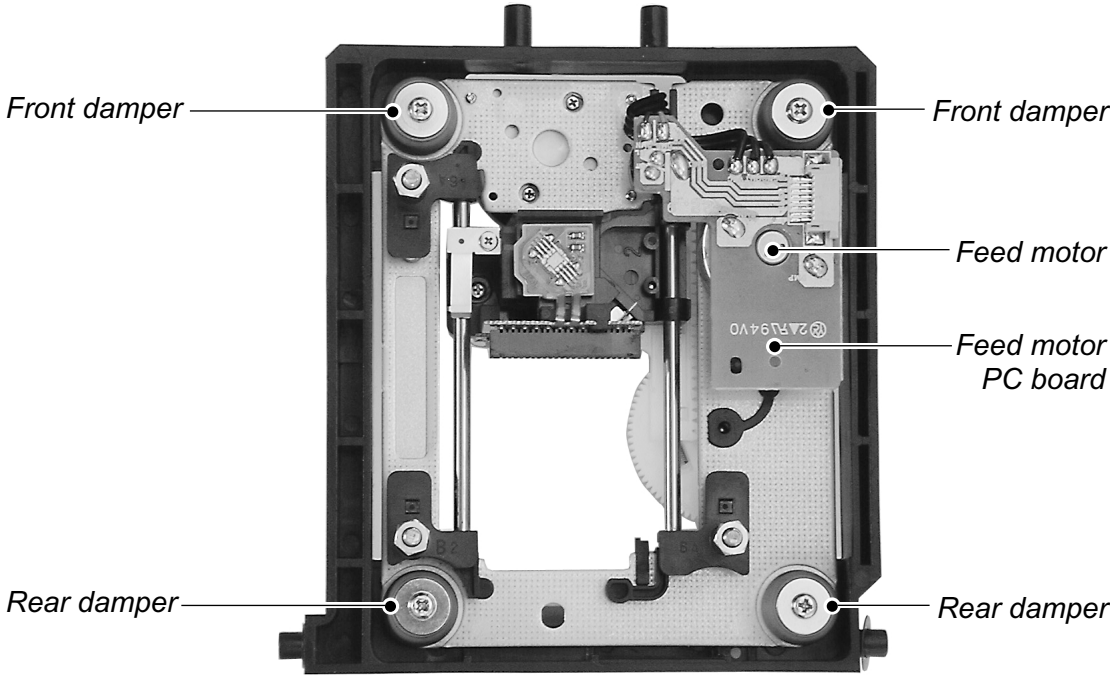


Fig. 1-2-6 Pickup mechanism chassis assembly (Bottom side)

2-2-2. Type B

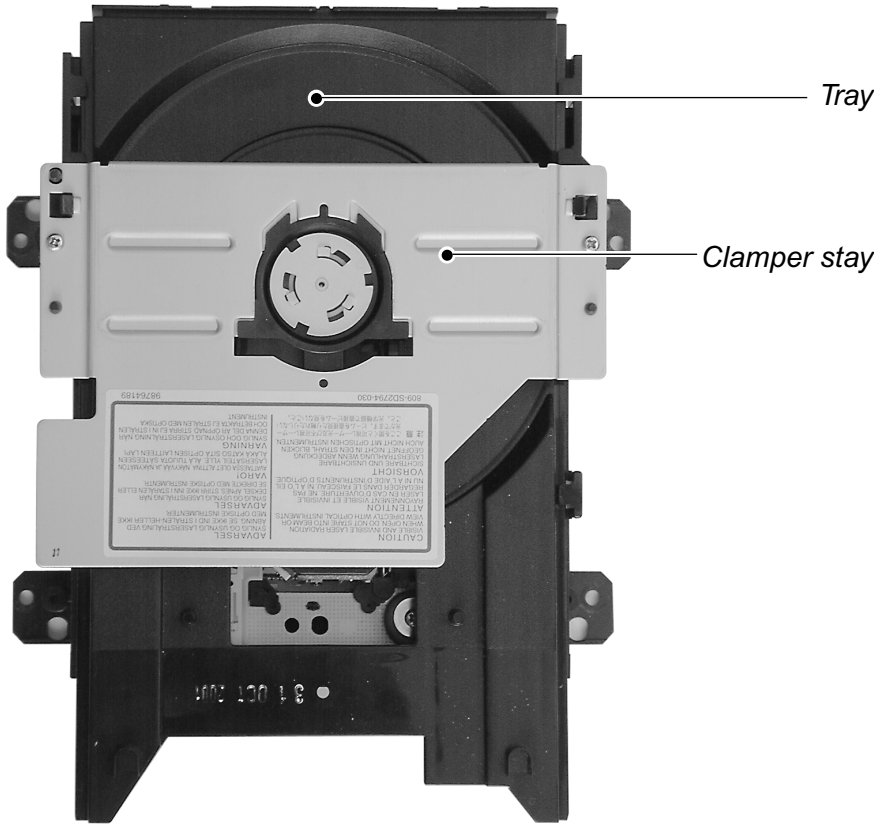


Fig. 1-2-7 Mechanism chassis assembly (Top side)

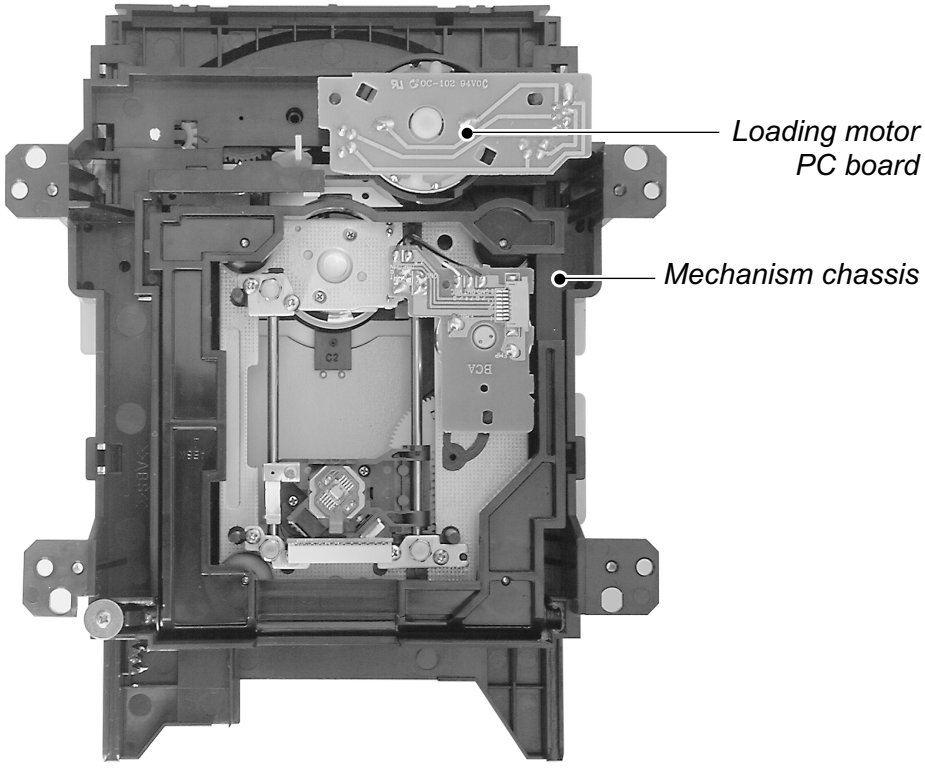


Fig. 1-2-8 Mechanism chassis assembly (Bottom side)

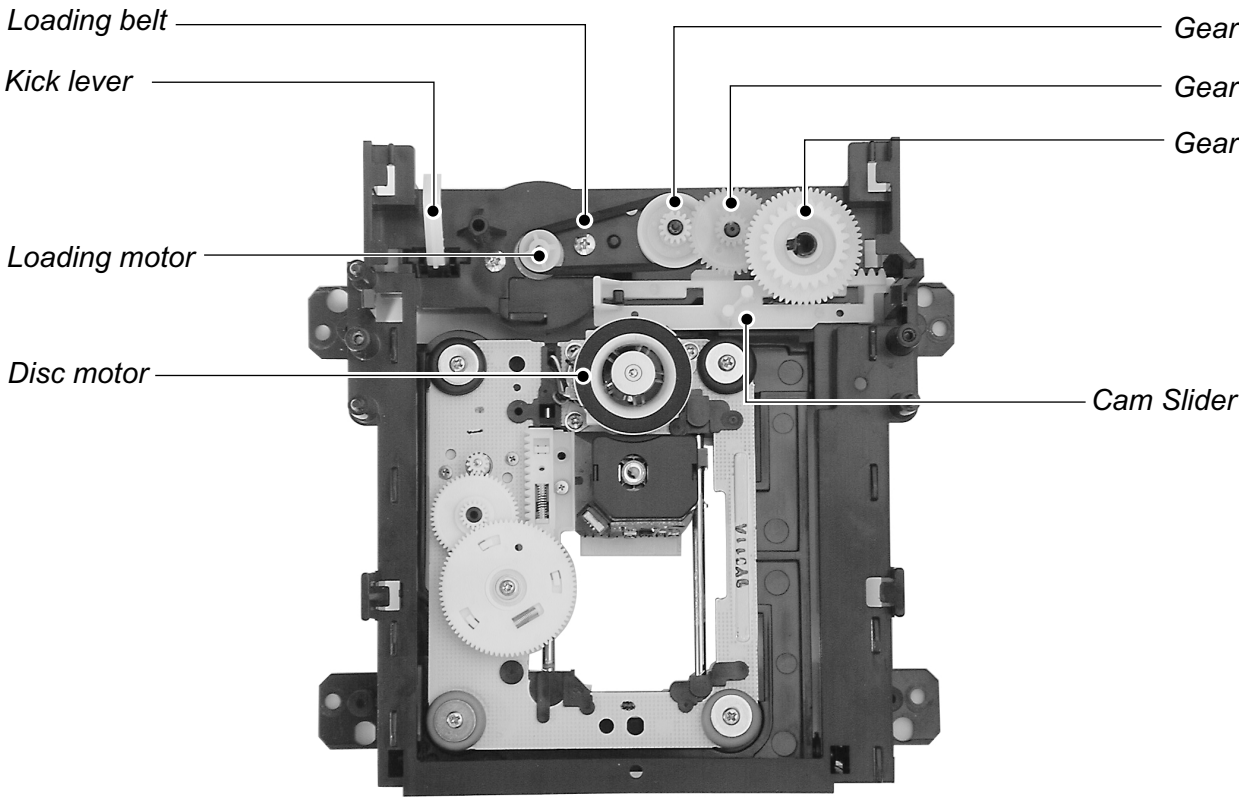


Fig. 1-2-9 Mechanism chassis assembly (Internal side)

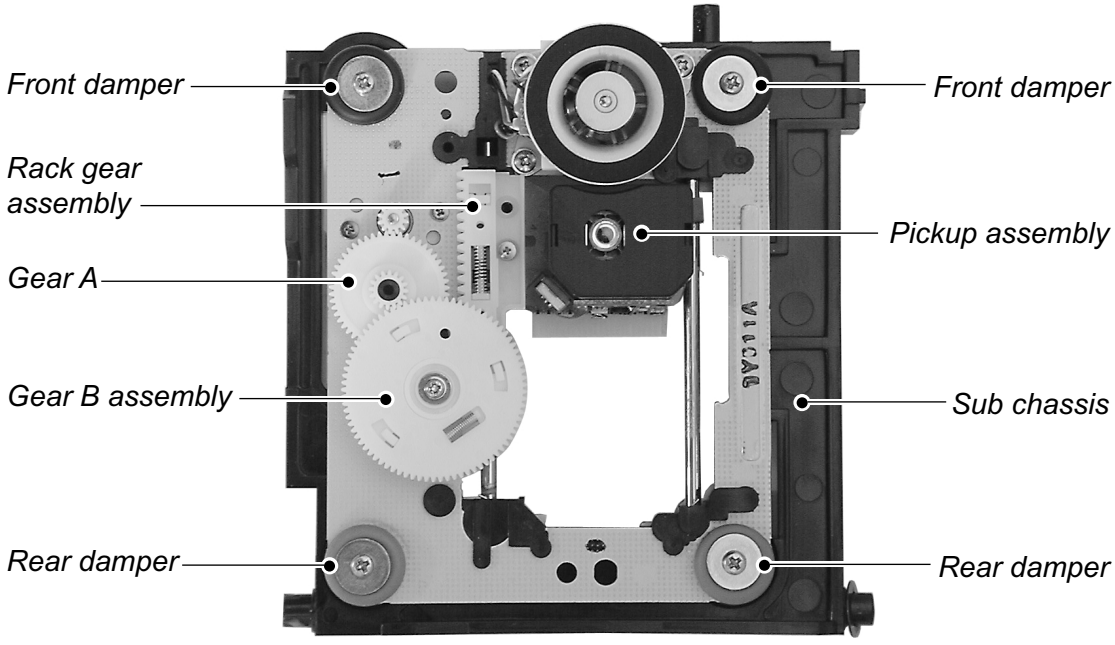


Fig. 1-2-10 Pickup mechanism chassis assembly (Top side)

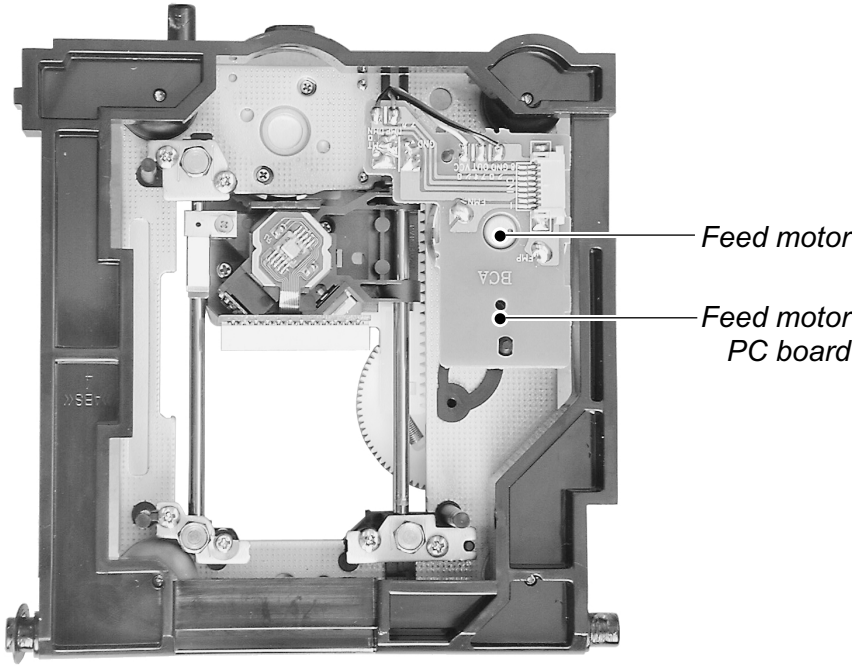


Fig. 1-2-11 Pickup mechanism chassis assembly (Bottom side)

3. TROUBLESHOOTING

3-1. Main Circuit

3-1-1. Servo System

(1) Initial Operation after Power ON

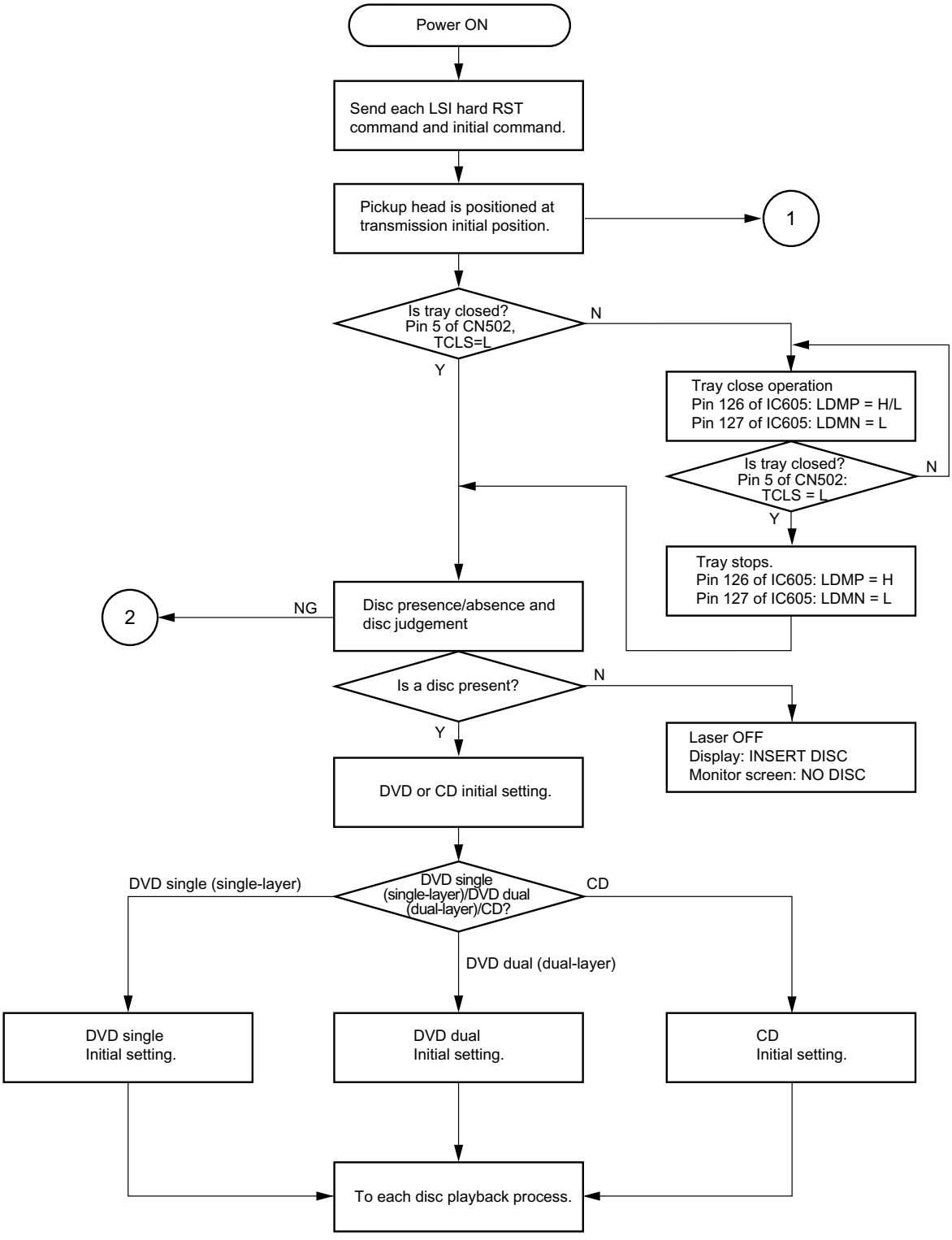


Fig. 1-3-1

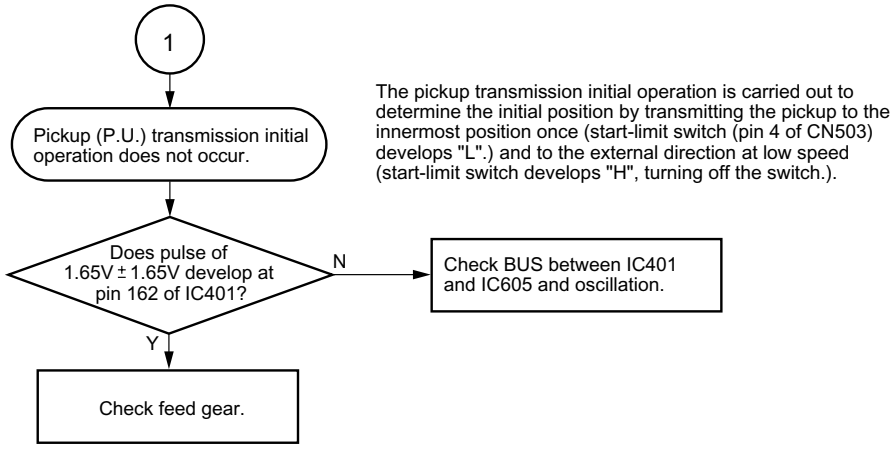

1
Pickup (P.U.) transmission initial operation does not occur.
Does pulse of 1.65V ± 1.65V develop at pin 162 of IC401?
N
Check BUS between IC401 and IC605 and oscillation.
Y
Check feed gear.
The pickup transmission initial operation is carried out to determine the initial position by transmitting the pickup to the innermost position once (start-limit switch (pin 4 of CN503) develops "L".) and to the external direction at low speed (start-limit switch develops "H", turning off the switch.).

Fig. 1-3-2

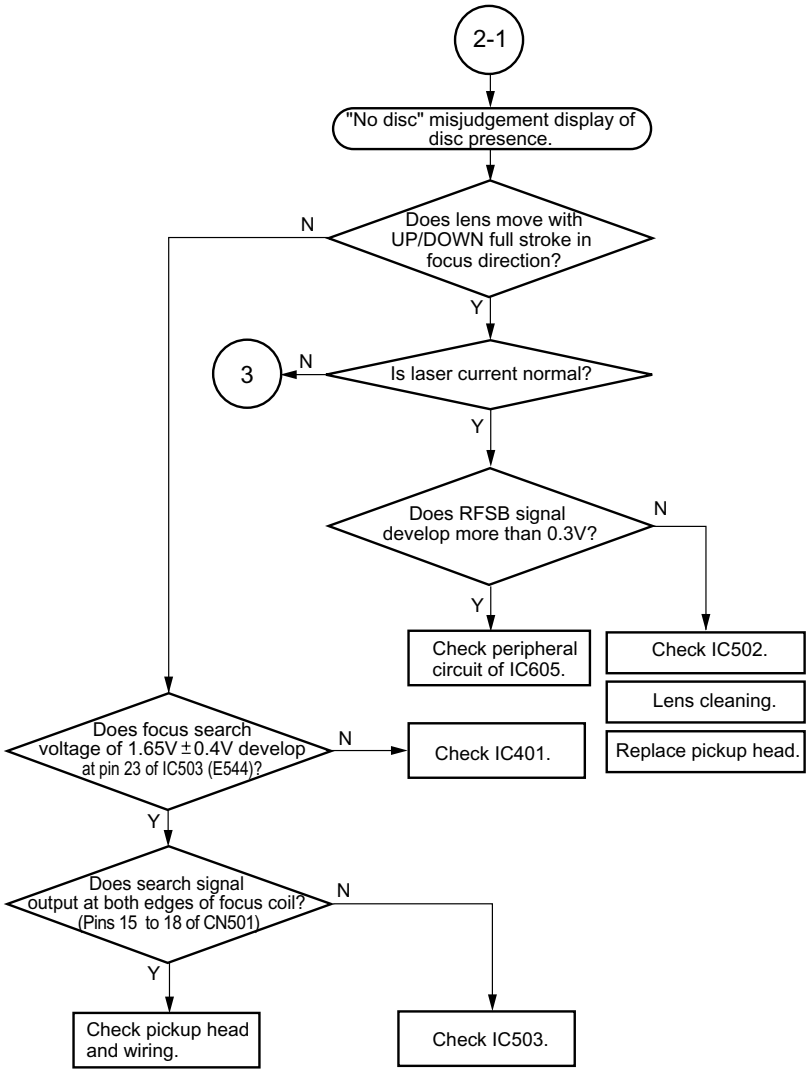


Fig. 1-3-3

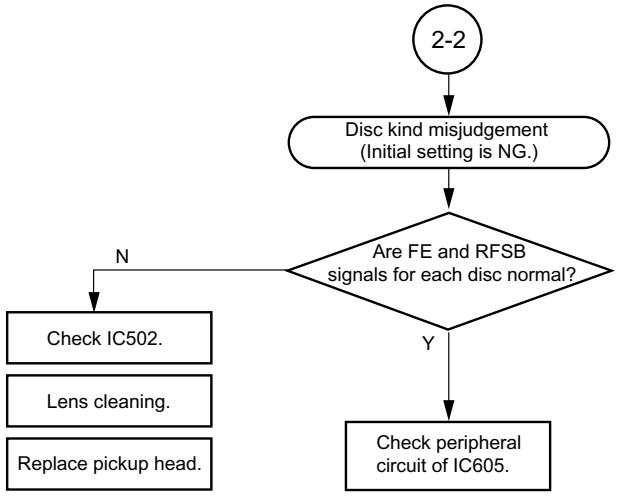
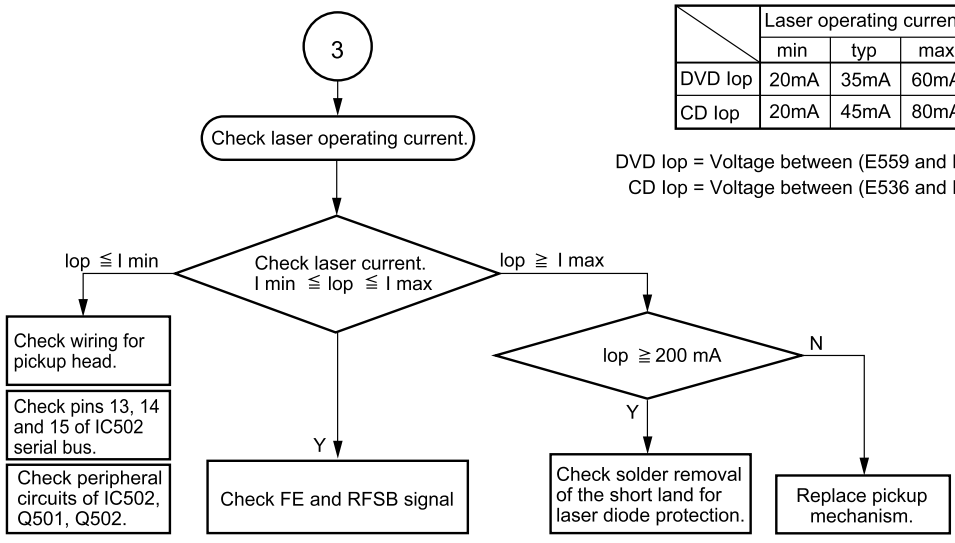


Fig. 1-3-4



	Laser operating current		
	min	typ	max
DVD Iop	20mA	35mA	60mA
CD Iop	20mA	45mA	80mA

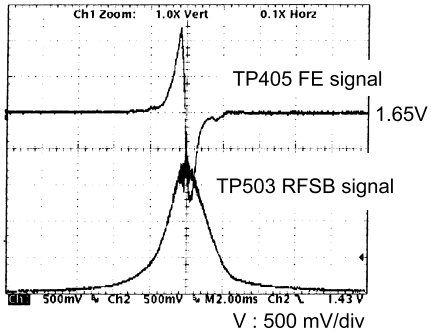
DVD Iop = Voltage between (E559 and E591) /10Ω
CD Iop = Voltage between (E536 and E591) /10Ω

To turn on each laser diode forcibly, press the following buttons on the remote controller.
DVD LD: ZOOM, 0, 3, 0, ZOOM
CD LD: ZOOM, 0, 3, 1, ZOOM
After checked the laser current, press POWER or OPEN/CLOSE button to turn it off.

CAUTION
- The laser ray emitting out from the pickup head is very harmful to your eyes.
  Keep your eyes from the objective lens at least 300mm distance during the pickup head operating.
- When you perform solder removal work, please turn OFF a set power supply and perform the ground of human body and a tool.

Fig. 1-3-5

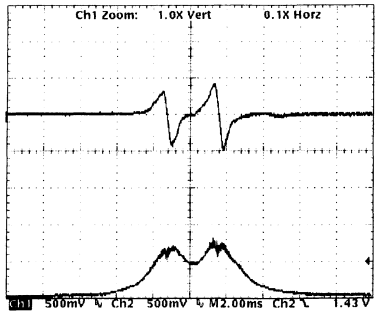
DVD single (single-layer) disc detection waveform



V : 500 mV/div
H : 2 ms/div

Fig. 1-3-6

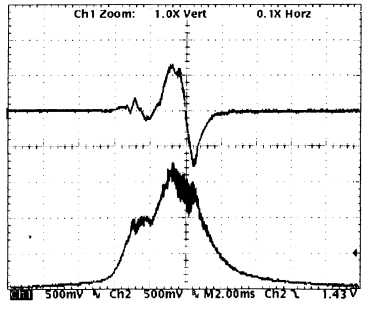
DVD dual (dual-layer) disc detection waveform



V : 500 mV/div
H : 2 ms/div

Fig. 1-3-7

CD disc detection waveform



V : 500 mV/div
H : 2 ms/div

Fig. 1-3-8

(2) Picture appears (PLAY)

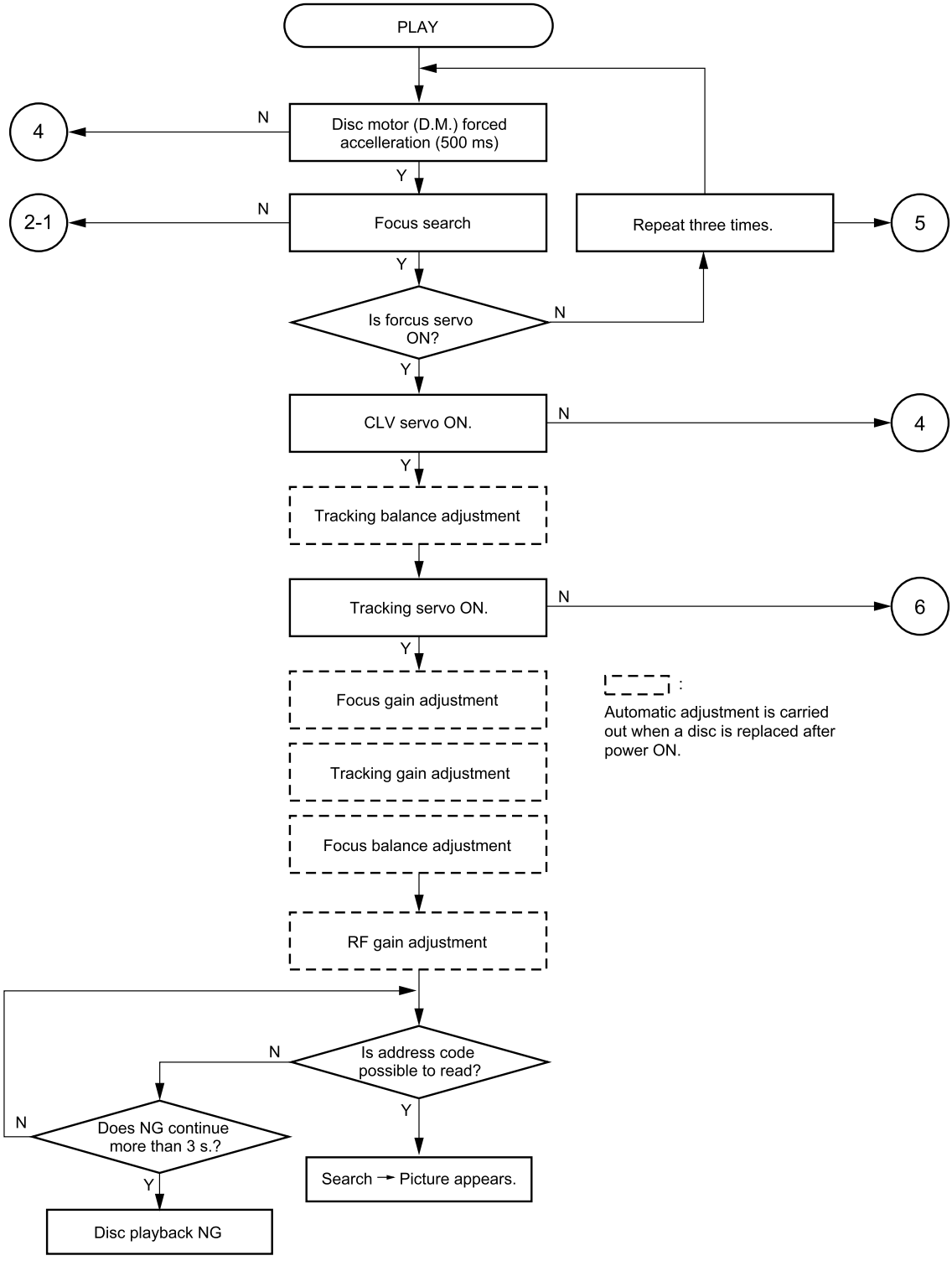


Fig. 1-3-9

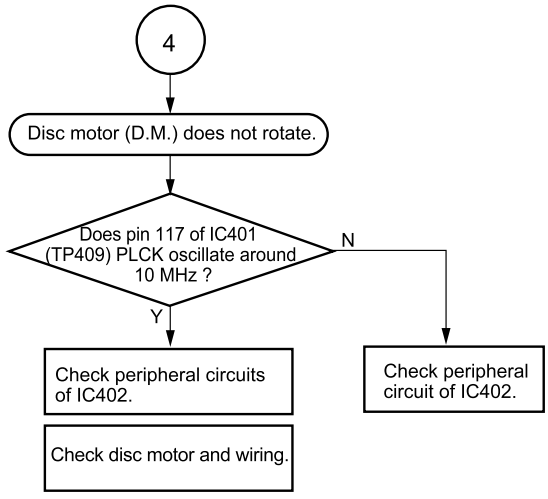

4
Disc motor (D.M.) does not rotate.
Does pin 117 of IC401 (TP409) PLCK oscillate around 10 MHz ?
N
Y
Check peripheral circuits of IC402.
Check peripheral circuit of IC402.
Check disc motor and wiring.

Fig. 1-3-10

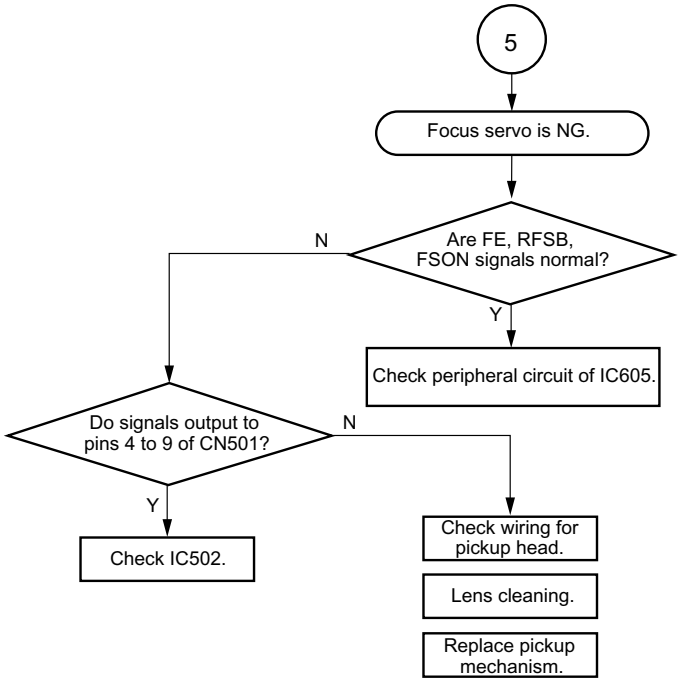


Fig. 1-3-11

Focus servo ON signal waveform

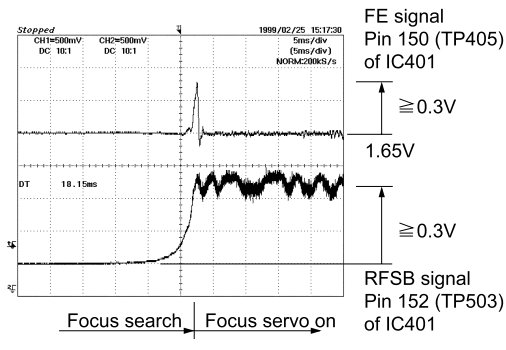


Fig. 1-3-12

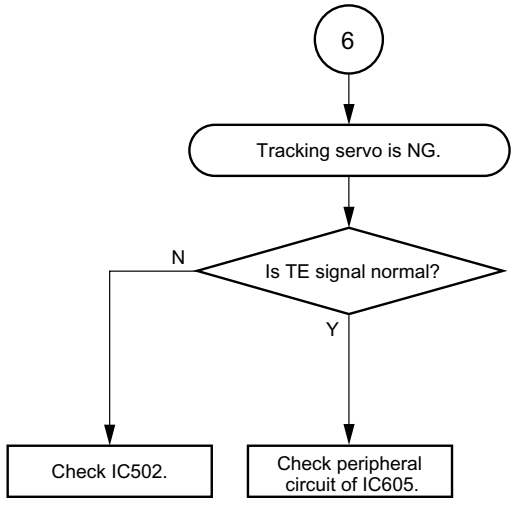
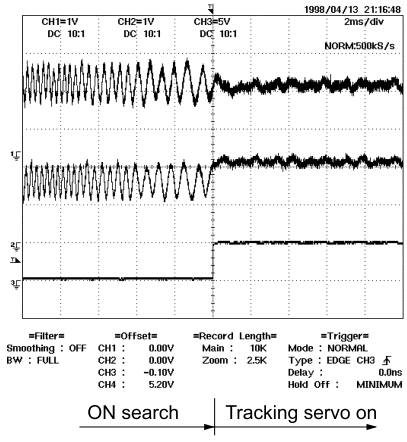


Fig. 1-3-13

Signal waveform at tracking servo ON (CD)


1998/04/13 21:16:48
CH1=1V DC 10:1
CH2=1V DC 10:1
CH3=5V DC 10:1
2ms/div
NORM:500kS/s
=Filter= Smoothing : OFF BW : FULL
=Offset= CH1 : 0.00V CH2 : 0.00V CH3 : -0.10V CH4 : 5.20V
=Record Length= Main : 10K Zoom : 2.5K
=Trigger= Mode : NORMAL Type : EDGE CH3 Delay : 0.0ns Hold Off : MINIMUM
ON search
Tracking servo on

TE signal
Pin 151 (TP406) of IC401
1.65V

RFRP signal
Pin 153 (TP408) of IC401

Search ON (SRCH)
Pin 38 (TP411) of IC401

Fig. 1-3-14

Signal waveform at tracking servo ON (DVD)

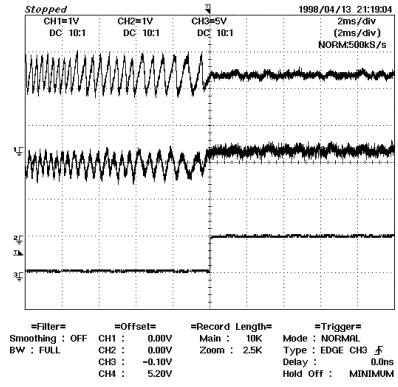

Stopped
1998/04/13 21:19:04
CH1=1V DC 10:1
CH2=1V DC 10:1
CH3=5V DC 10:1
2ms/div
(2ms/div)
NORM:500kS/s
=Filter= Smoothing : OFF BW : FULL
=Offset= CH1 : 0.00V CH2 : 0.00V CH3 : -0.10V CH4 : 5.20V
=Record Length= Main : 10K Zoom : 2.5K
=Trigger= Mode : NORMAL Type : EDGE CH3 Delay : 0.0ns Hold Off : MINIMUM

Fig. 1-3-15

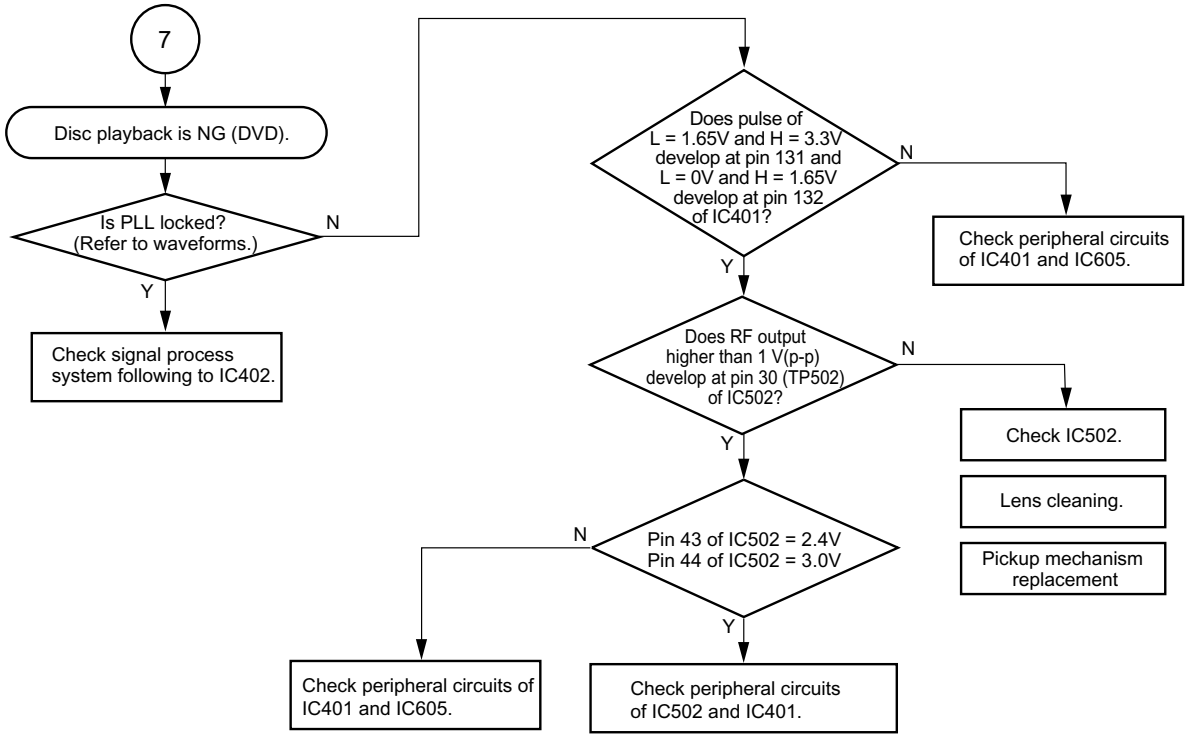
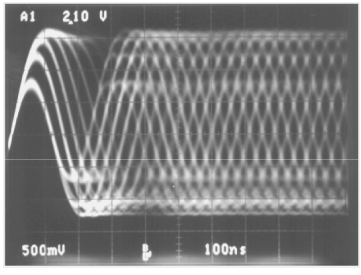


Fig. 1-3-16

PLL works as a servo loop to generate a clock signal for reading RF signal binary data. With the PLL locked, the eye pattern is identified clearly when triggered with the read clock PLCK.

DVD RF signal

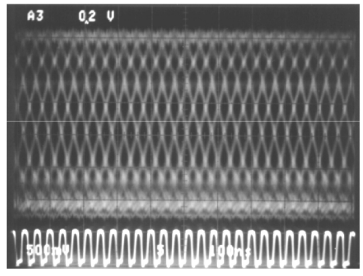


DVD RF signal
Pin 30 (TP502) of IC502

V : 500 mV/div
H : 50 ns/div

Fig. 1-3-17

DVD playback waveform



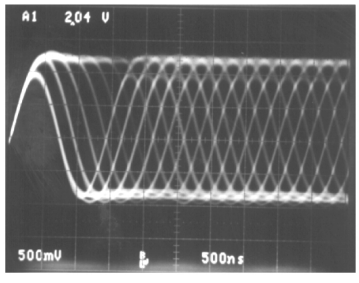
DVD RF signal
Pin 30 (TP502) of IC502

DVD PLCK
Pin 117 (TP409) of IC401

CH1 : TP502 DVDRF 500 mV/div
CH2 : TP409 DVDPLCK 5 V/div
50 ns/div

Fig. 1-3-19

CD RF signal

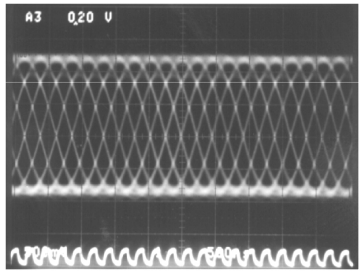


CD RF signal
Pin 30 (TP502) of IC502

V : 500 mV/div
H : 100 ns/div

Fig. 1-3-18

CD playback waveform



CD RF signal
Pin 30 (TP502) of IC502

CD PLCK
Pin 117 (TP409) of IC401

CH1 : TP502 CDRF 500 mV/div
CH2 : TP409 CDPLCK 5 V/div
100 ns/div

Fig. 1-3-20

3-1-2. Location Diagram of Servo Test Point

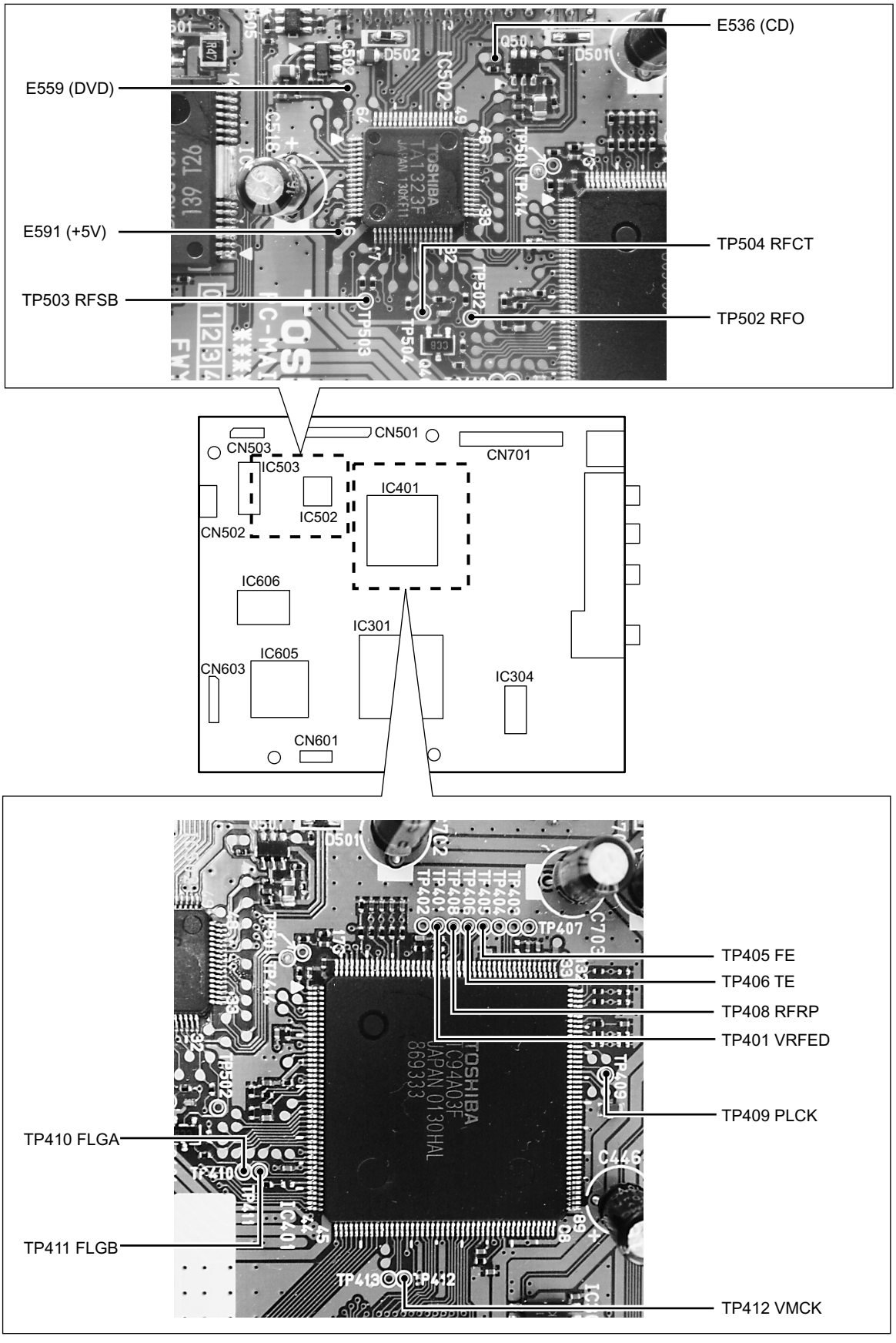


Fig. 1-3-21

SECTION 2
PART REPLACEMENT AND ADJUSTMENT PROCEDURES

CAUTIONS BEFORE STARTING SERVICING

Electronic parts are susceptible to static electricity and may easily damaged, so do not forget to take a proper grounding treatment as required.

Many screws are used inside the unit. To prevent missing, dropping, etc. of the screws, always use a magnetized screwdriver in servicing. Several kinds of screws are used and some of them need special cautions. That is, take care of the tapping screws securing molded parts and fine pitch screws used to secure metal parts. If they are used improperly, the screw holes will be easily damaged and the parts can not be fixed.

1. REPLACEMENT OF MECHANICAL PARTS (TYPE A)

1-1. Cabinet Replacement

1-1-1. Top Cover

1. Remove seven screws (1) and remove the top cover (2).

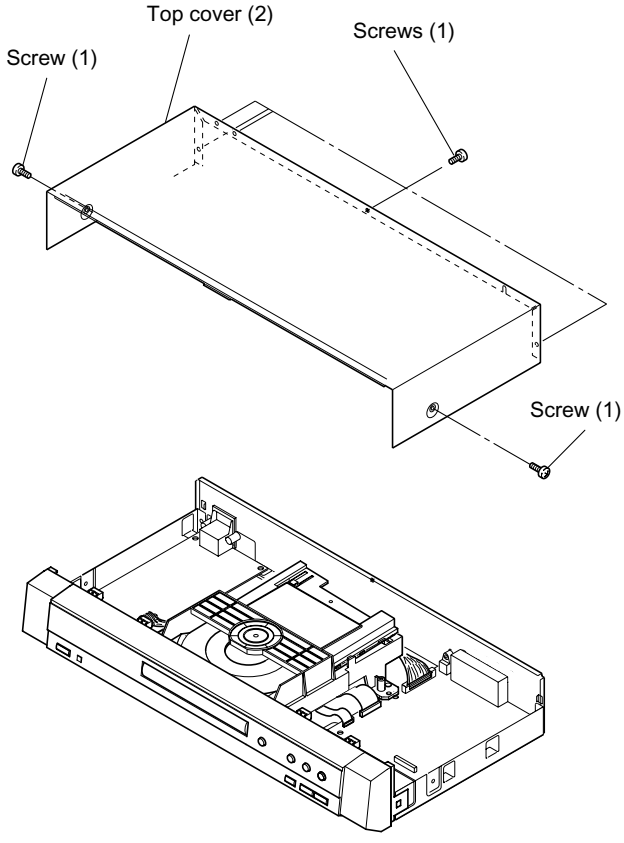


Fig. 2-1-1

1-1-2. Tray Panel

<Tray Ejection>

1. Insert a paper clip, etc. into the hole A to eject the tray (1).

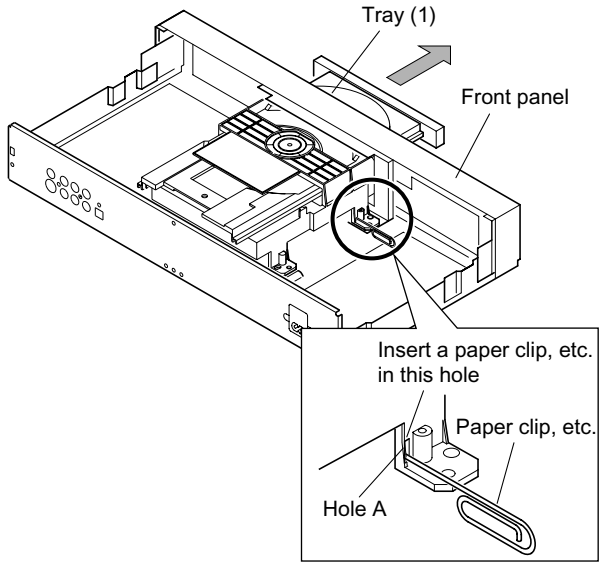


Fig. 2-1-2

<Tray Panel Removal>

1. Eject the tray (1). (Refer to item 1-1-2.)
2. Twist the tray panel (2) a little in the arrow A direction with the tray (1) hold by hand to release two claws and lift up the tray panel (2) in the arrow B direction, then the tray panel (2) is removed.
3. When mounting the tray panel (2), insert the tray panel (2) along the grooves of the both sides of the tray (1) until clicking.

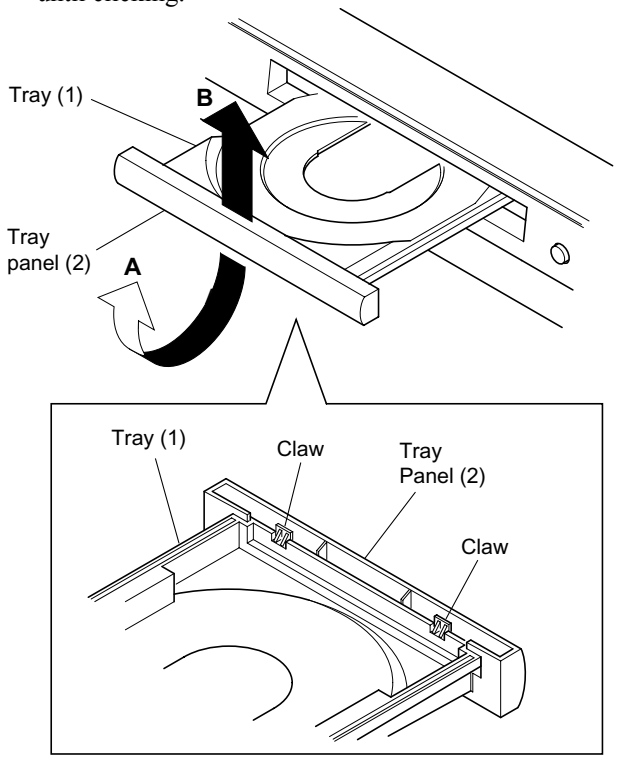


Fig. 2-1-3

1-1-3. Front Panel

1. Remove one flexible cable (1).
2. Release four claws and remove the front panel (2).

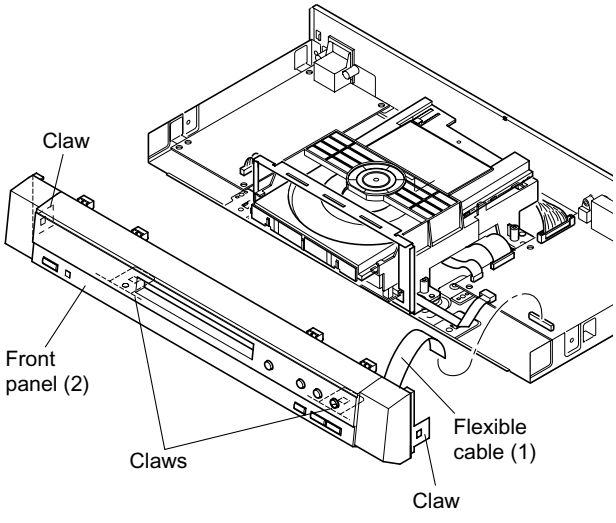


Fig. 2-1-4

1-1-4. Tray

1. Pull out the tray (1) towards you until it stops.
2. Lift up claw A with a minus screwdriver, and pull out the tray (1) towards you, then remove the tray (1).

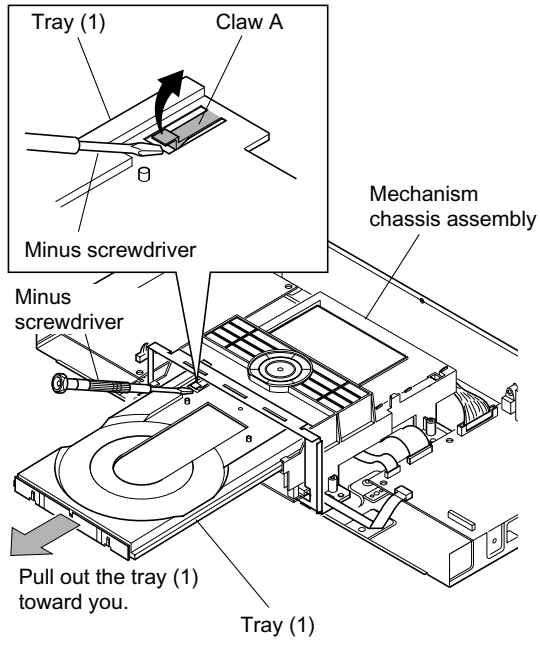


Fig. 2-1-5

1-1-5. Rear Panel

1. Remove six screws (1) and remove the rear panel (2).

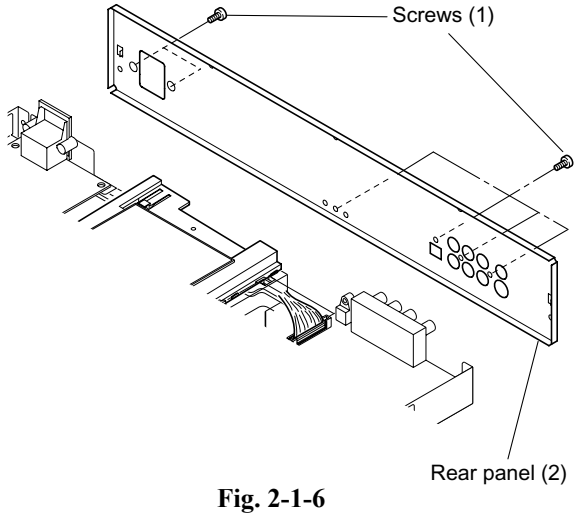


Fig. 2-1-6

1-2. PC Board Replacement

1-2-1. Main PC Board

Note:

- Before removing the main PC board (4), be sure to short-circuit the laser diode output land.

  After replacing, open the land as it was after inserting the flexible cables (1).

1. Remove the top cover. (Refer to item 1-1-1.)
2. Eject the tray. (Refer to item 1-1-2.)
3. Remove four flexible cables (1) and remove one connector (2).
4. Remove seven screws (3) and the main PC board (4).

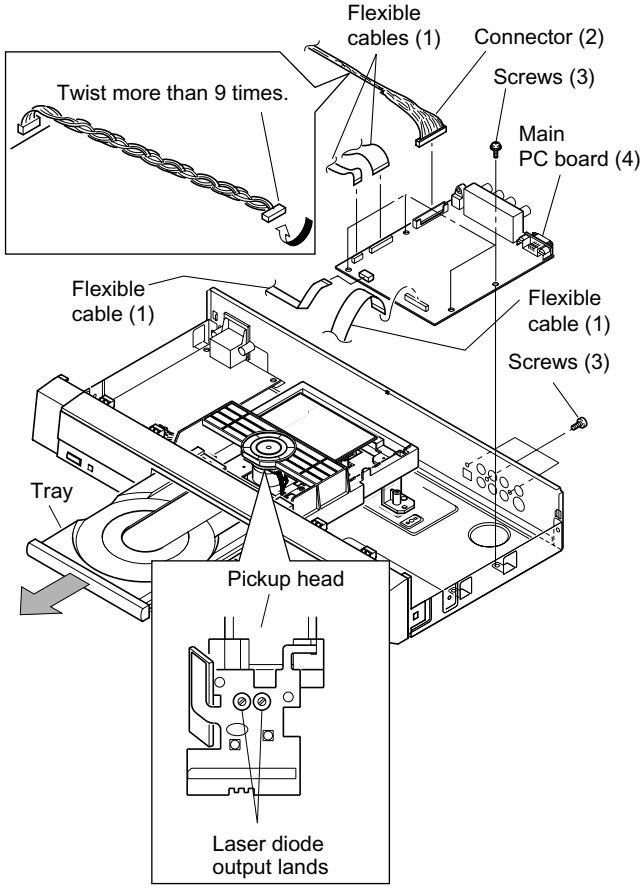


Fig. 2-1-7

1-2-2. Power PC board

1. Peel off two tapes (1) and remove the connector (2).
2. Remove six screws (3) and remove the power supply PC board (4).

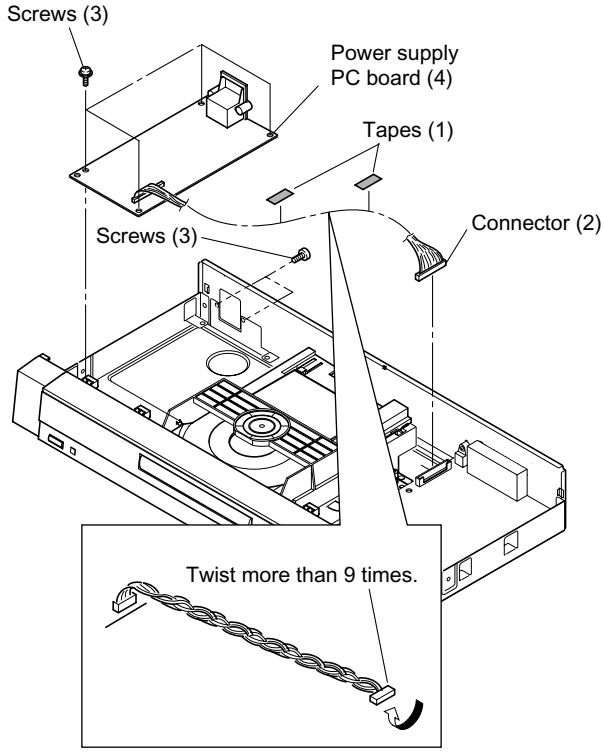


Fig. 2-1-8

1-2-3. Front PC Board

1. Remove the front panel. (Refer to item 1-1-3.)
2. Remove nine screws (1) and remove the front display PC board (2).

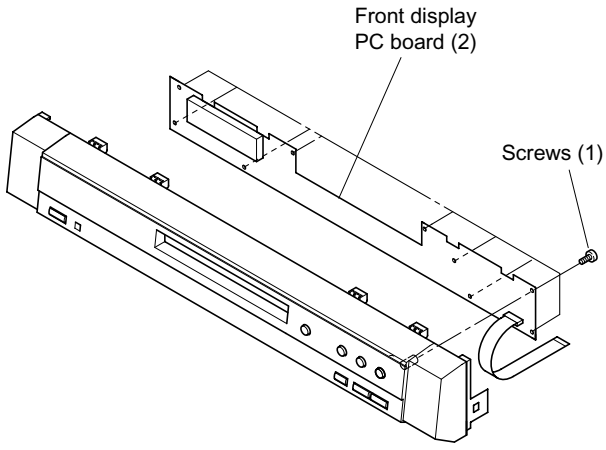


Fig. 2-1-9

1-3. Mechanism Parts

1-3-1. Mechanism Chassis Assembly

Note:

- When removing the mechanism chassis assembly (3), be sure to short-circuit the laser diode output land before removing the connector and the flexible cables.

  After replacing, open the land as it was after inserting the connector and flexible cables.

1. Remove the front panel. (Refer to item 1-1-3.)
2. Remove three flexible cables (1).
3. Remove four screws (2) and remove the mechanism chassis assembly (3).

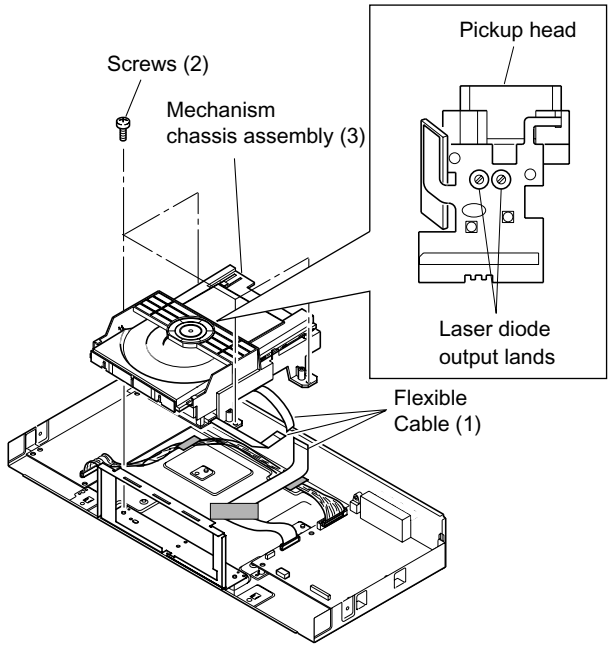


Fig. 2-1-10

2. REPLACEMENT OF MECHANICAL PARTS (TYPE B)

2-1. Cabinet Replacement

2-1-1. Top Cover

1. Remove seven screws (1) and remove the top cover (2).

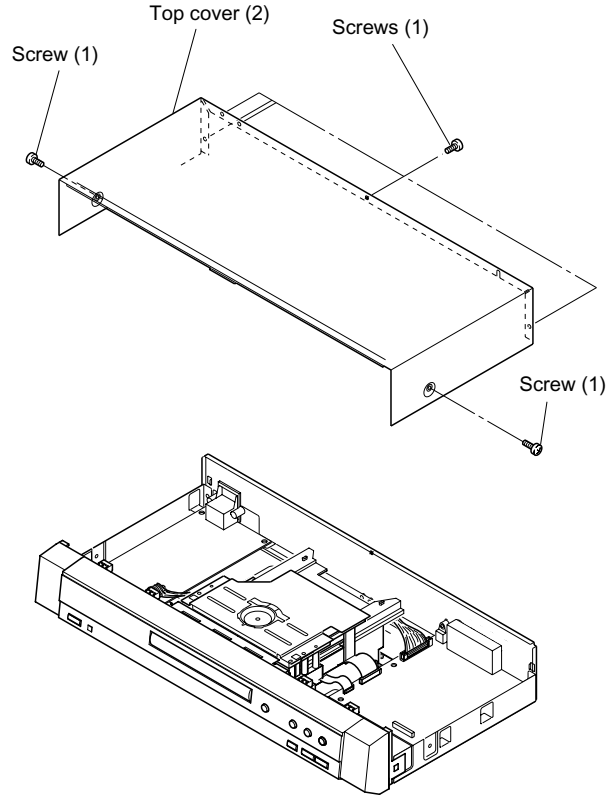


Fig. 2-1-11

2-1-2. Clamper Stay

<Removal>

1. Remove two screws (1).
2. Release two claws and remove the clamper stay (2).

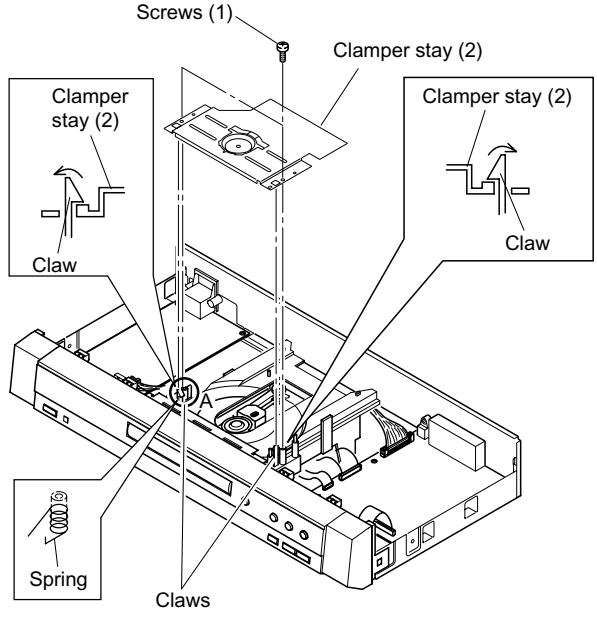


Fig. 2-1-12

<Mounting >

1. The spring for tray side pressure is inserted into the portion “A”. (Refer to Fig. 2-1-12.)
2. By referring to Fig. 2-1-13, insert the spring normally and mount the clamper stay.

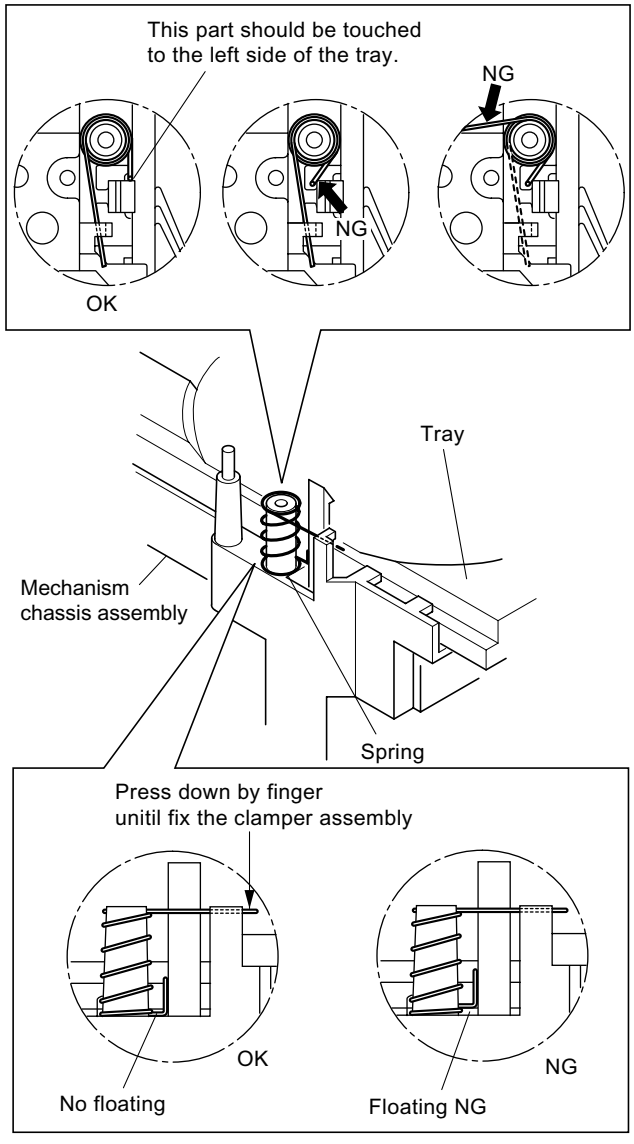


Fig. 2-1-13

2-1-3. Tray Panel

<Tray Ejection>

1. Slide the slider (2) of the mechanism chassis assembly (1) with a screwdriver, etc. in the arrow direction, so that the tray (3) is ejected.

Note:

- Take care not to damage the pickup and other parts.

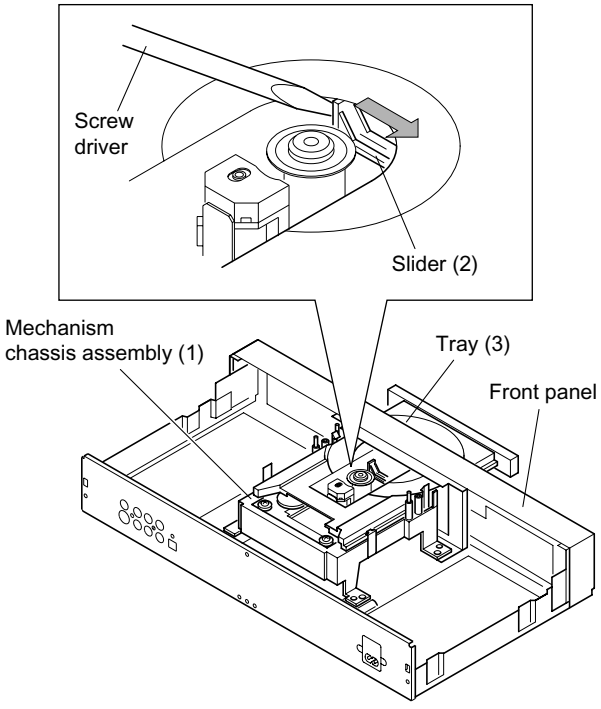


Fig. 2-1-14

<Tray Panel Removal>

1. Eject the tray (3).
2. Twist the tray panel (4) a little in the arrow A direction with the tray (3) hold by hand to release two claws and lift up the tray panel (4) in the arrow B direction, then the tray panel (4) is removed. (Refer to Fig. 2-1-15.)
3. When mounting the tray panel (4), insert the tray panel (4) along the grooves of the both sides of the tray (3) until clicking.

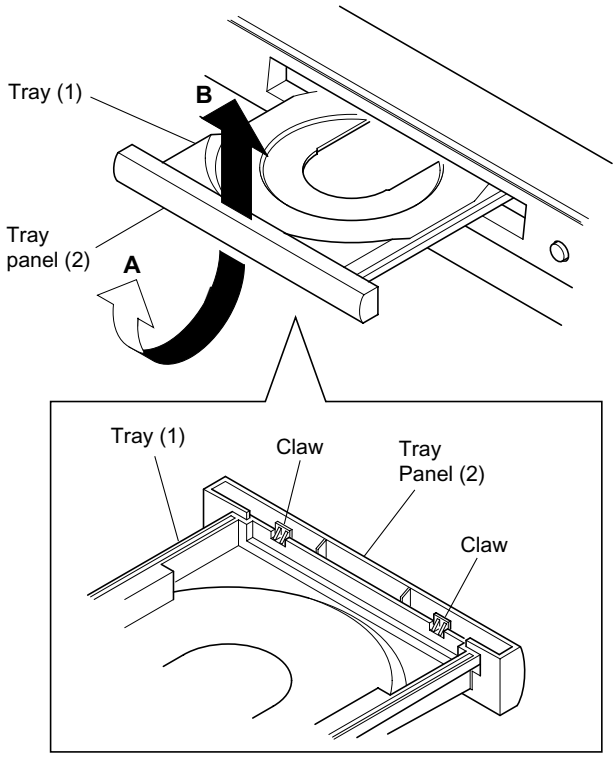


Fig. 2-1-15

2-1-4. Front Panel and Tray

1. Remove the flexible cable (1).
2. Release four claws and remove the front panel (2).
3. Pull out the tray (3) towards you.

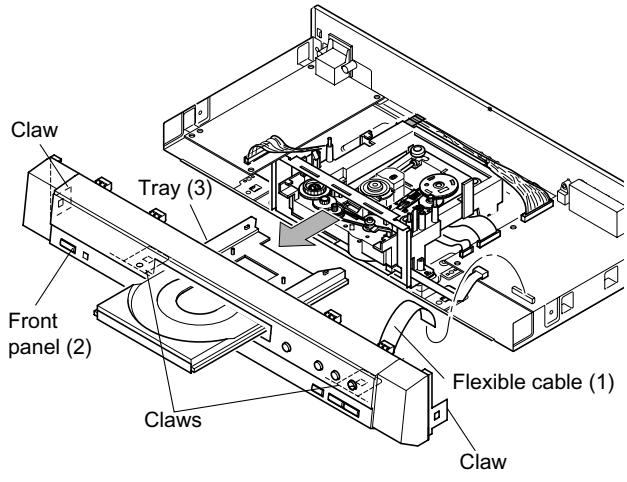


Fig. 2-1-16

Note:

- Insert the tray (3) with the front side of the pickup mechanism assembly descended. (The slider positions to the left side.)
- The gears are required to match their phases each other. After setting the gear (4) as shown in the figure “A”, insert the tray (3). When inserting a tray (3), push the rack gear side shown by the arrow.

- Confirm that the mark of the gear matches with the triangle mark on the reverse side of the tray in the tray close status. (The gear is rotated with the slider locks.) (Refer to Fig. B.)

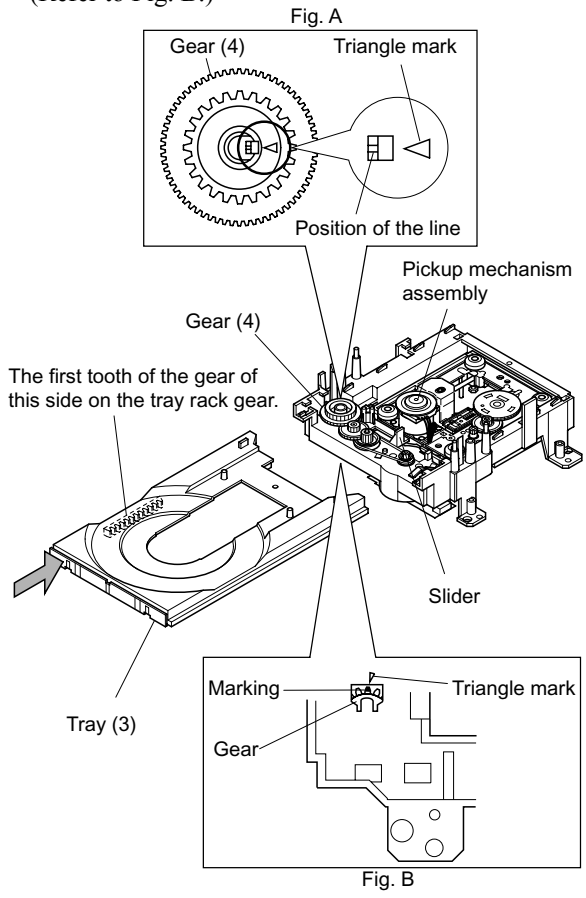


Fig. 2-1-17

2-1-5. Rear Panel

1. Remove six screws (1) and remove the rear panel (2).

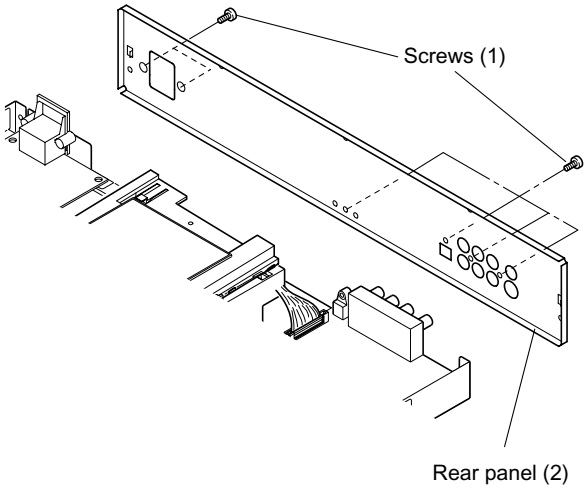


Fig. 2-1-18

2-2. PC Board Replacement

2-2-1. Main PC Board

Note:

- Before removing the main PC board (4), be sure to short-circuit the laser diode output land.

  After replacing, open the land as it was after inserting the flexible cables (1).

1. Remove the top cover. (Refer to item 2-1-1.)
2. Eject the tray. (Refer to item 2-1-3.)
3. Remove four flexible cables (1) and remove one connector (2).
4. Remove seven screws (3) and the main PC board (4).

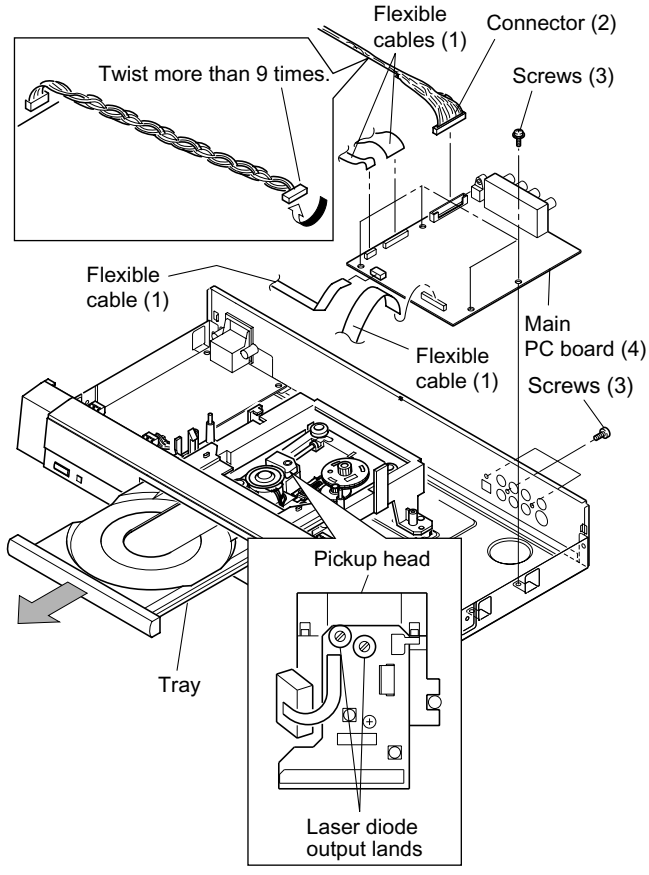


Fig. 2-1-19

2-2-2. Power PC board

1. Peel off two tapes (1) and remove the connector (2).
2. Remove six screws (3) and remove the power supply PC board (4).

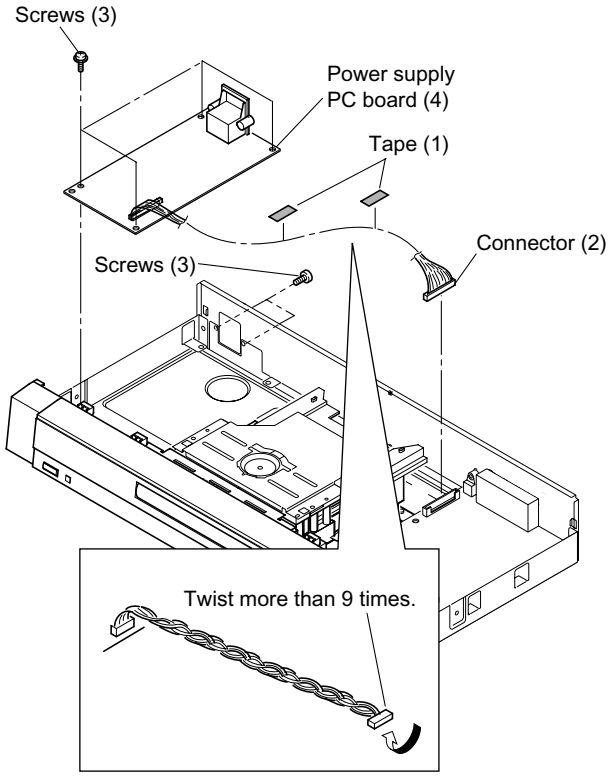


Fig. 2-1-20

2-2-3. Front PC Board

1. Remove the front panel. (Refer to item 2-1-3.)
2. Remove nine screws (1) and remove the front display PC board (2).

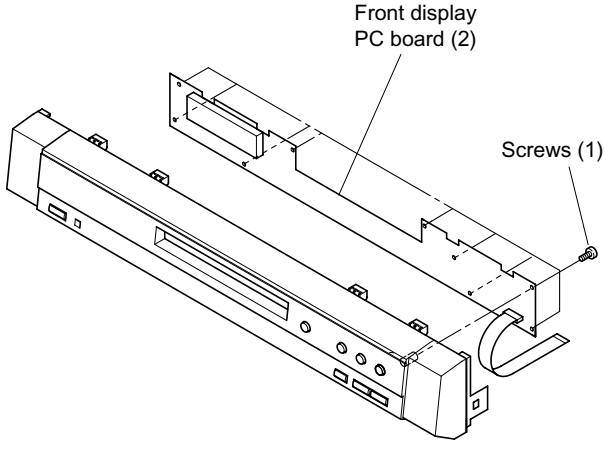


Fig. 2-1-21

2-3. Mechanism Parts

2-3-1. Mechanism Chassis Assembly

Note:

- When removing the mechanism chassis assembly (3), be sure to short-circuit the laser diode output land before removing the connector and the flexible cables.

  After replacing, open the land as it was after inserting the connector and flexible cables.

1. Remove the tray. (Refer to items 2-1-3 and 2-1-4.)
2. Remove three flexible cables (1).
3. Remove four screws (2) and remove the mechanism chassis assembly (3).

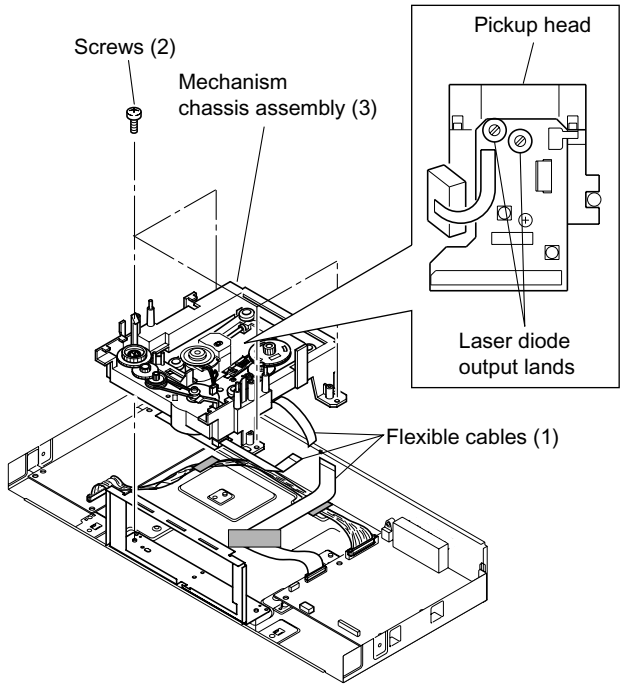


Fig. 2-1-22

SECTION 4
PARTS LIST

SAFETY PRECAUTION

The parts identified by ! (⚠) mark are critical for safety. Replace only with part number specified.

The mounting position of replacement is to be identical with originals.

The substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create shock, fire or other hazards.

NOTICE

The part number must be used when ordering parts in order to assist in processing, be sure to include the model number and description.

ABBREVIATIONS

1. Integrated Circuit (IC)

2. Capacitor (Cap)

- **Capacitance Tolerance (for Nominal Capacitance more than 10pF)**

Table 4-2-1

Symbol	B	C	D	F	G	J	K	M	N
Tolerance %	± 0.1	± 0.25	± 0.5	± 1	± 2	± 5	± 10	± 20	± 30

Symbol	P	Q	T	U	V	W	X	Y	Z
Tolerance %	+ 100 0	+ 30 – 10	+ 50 – 10	+ 75 – 10	+ 20 – 10	+ 100 – 10	+ 40 – 20	+ 150 – 10	+ 80 – 20

Ex. 10MF J = 10μF ± 5%

- **Capacitance Tolerance (for Nominal Capacitance 10pF or less)**

Table 4-2-2

Symbol	B	C	D	F	G
Tolerance pF	± 0.1	± 0.25	± 0.5	± 1	± 2

Ex. 10pF G = 10pF ± 2pF

3. Resistor (Res)

- **Resistance tolerance**

Table 4-3-1

Symbol	B	C	D	F	G	J	K	M
Tolerance %	± 0.1	± 0.25	± 0.5	± 1	± 2	± 5	± 10	± 20

Ex. 470ohmJ = 470ohm± 5%

4. EXPLODED VIEWS

4-1. Packing Assembly

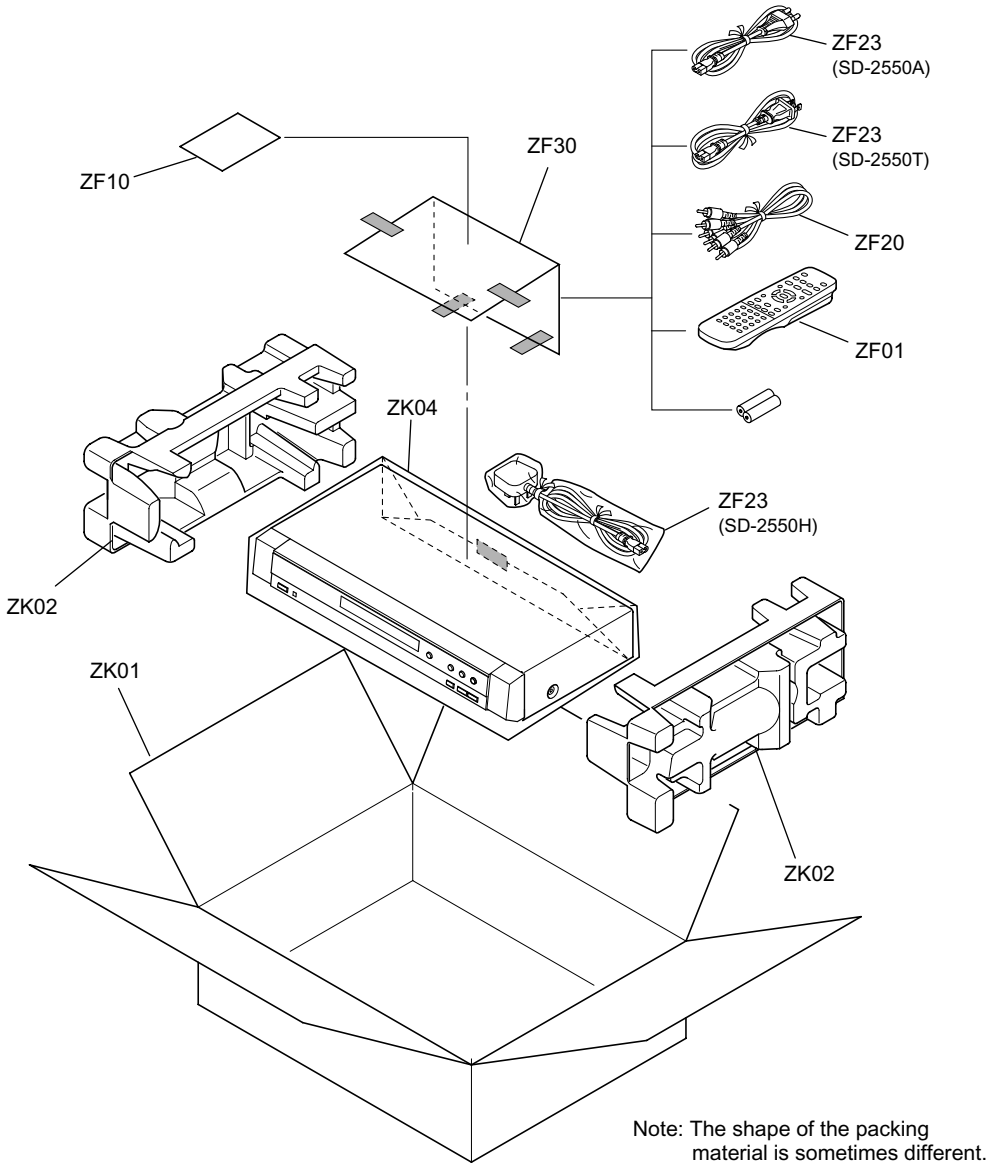


Fig. 4-4-1

4-2. Chassis Assembly (Type A)

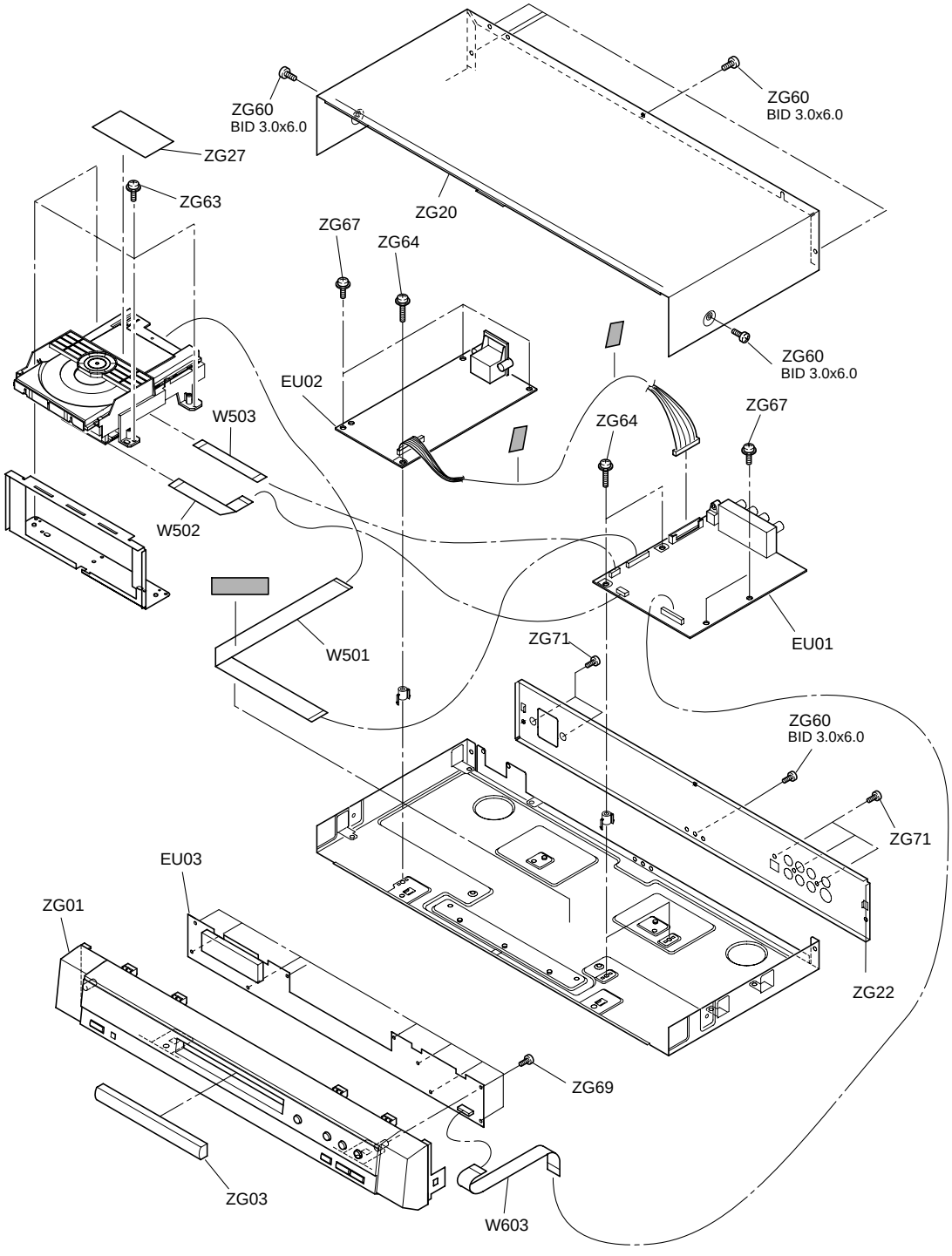


Fig. 4-4-2

4-3. Mechanism Assembly (Type A)

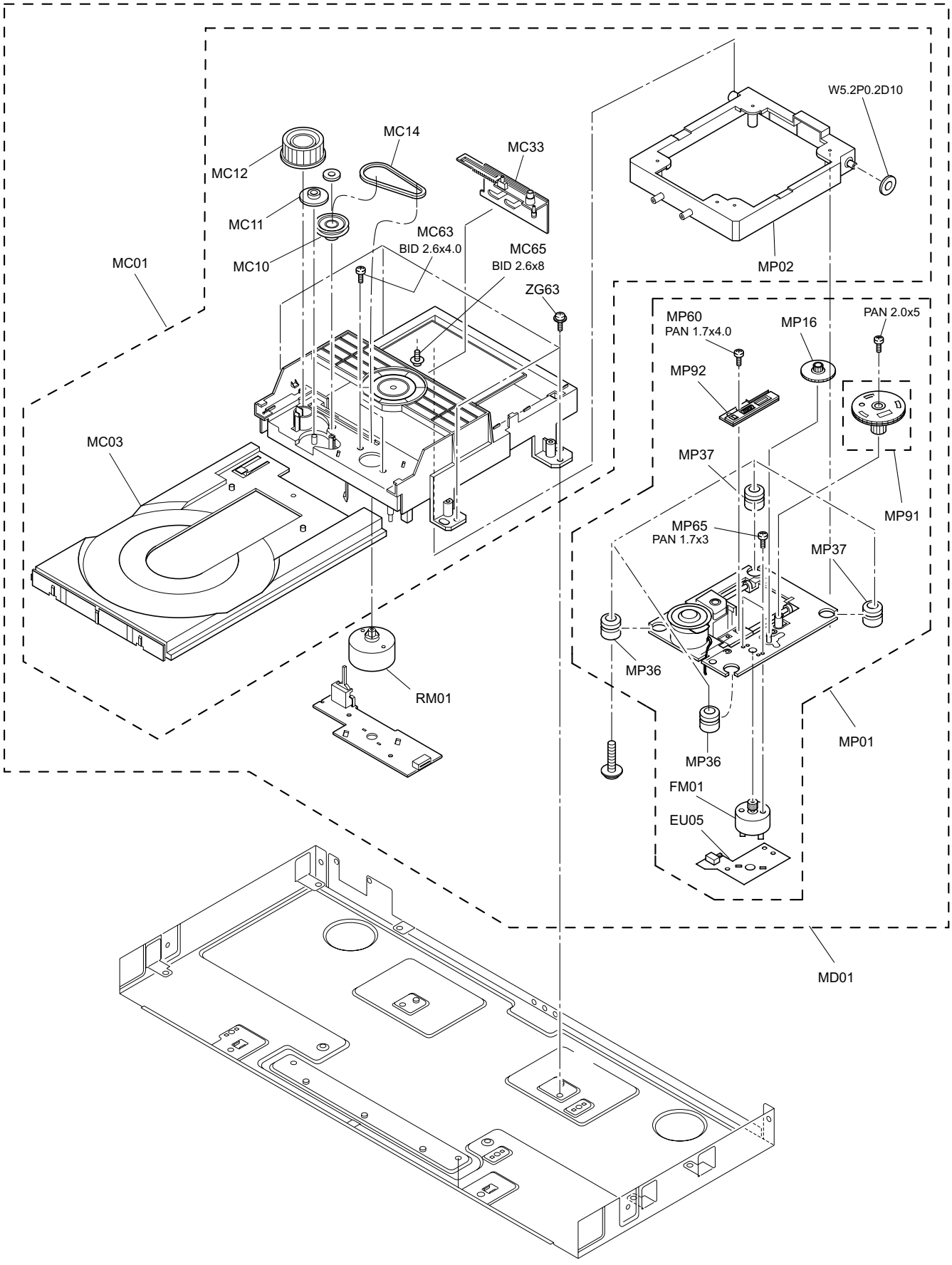


Fig. 4-4-3

4-4. Chassis Assembly (Type B)

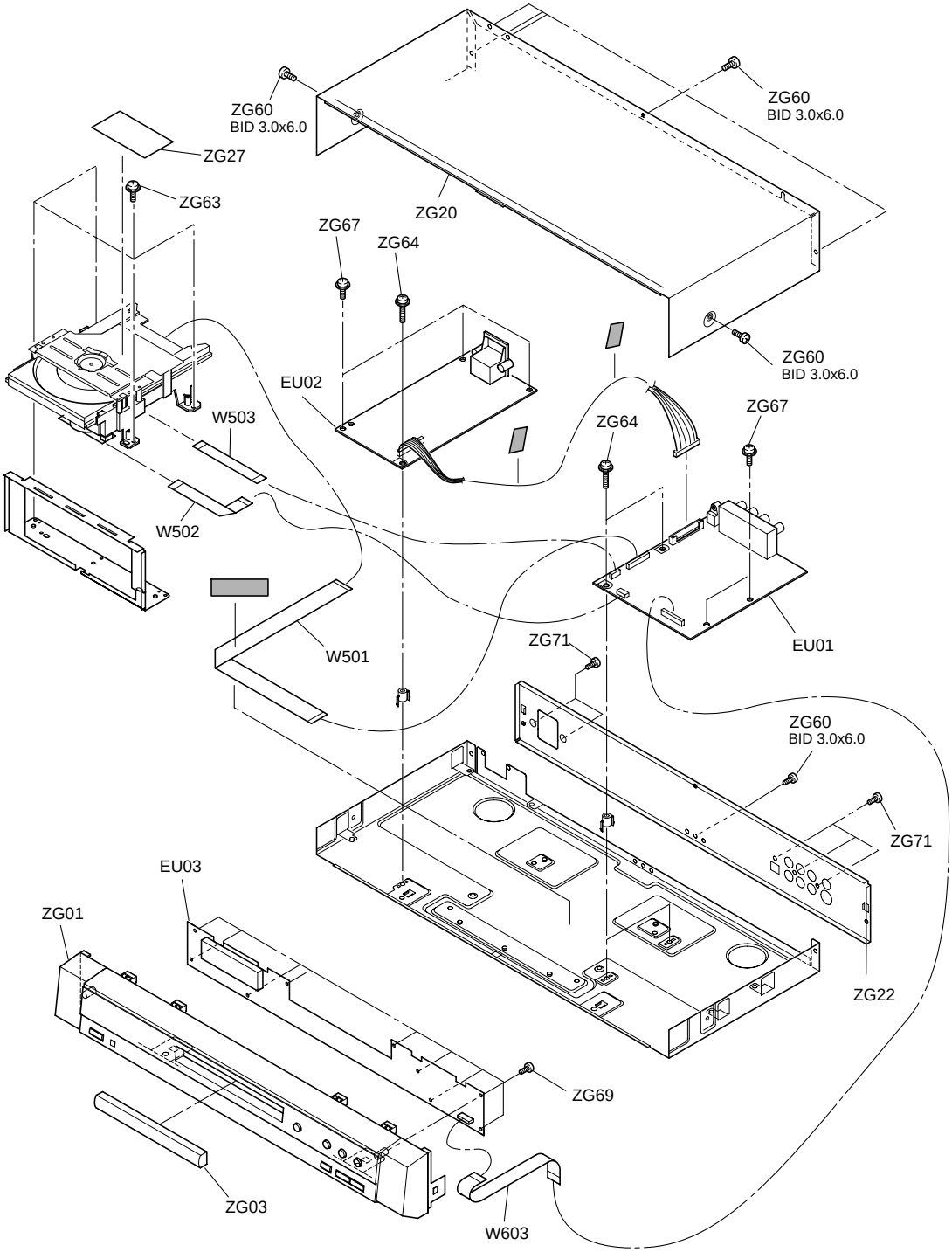


Fig. 4-4-4

4-5. Mechanism Assembly (Type B)

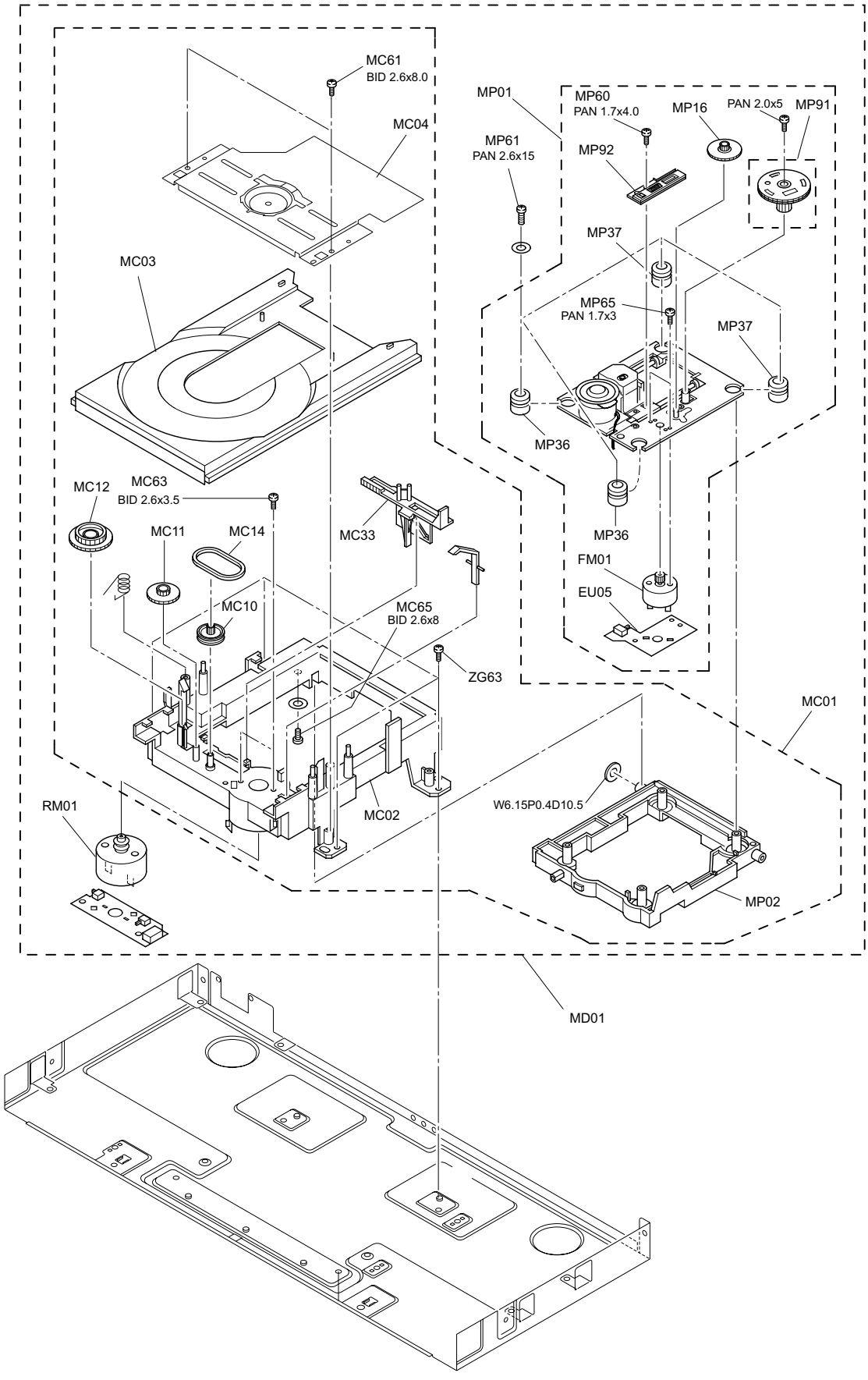


Fig. 4-4-5

5. PARTS LIST

	LOCATION NUMBER	PART NUMBER	DESCRIPTION	
			- MECHANICAL PARTS -	
!	MD01	79070499	DVD Mechanism	Single/CD-R
	W501	79080273	Cable,Flexible	FFC,23P,L297
	W502	79080192	Cable,Flexible	FFC,6P,L110
	W503	79080193	Cable,Flexible	FFC,8P,L85
	W603	79080190	Cable,Flexible	FFC,13P,L150
!	ZF01	79078069	Remote Control Unit,SE-R0049	
!	ZF10	79077206	Owners Manual,English/Chinese,SD-2550A/H	
!	ZF10	79077207	Owners Manual,Chinese,SD-2550T	
!	ZF23	79088010	Power Cord	SD-2550A
!	ZF23	79088014	Power Cord	SD-2550T
!	ZF23	79088034	Power Cord	SD-2550H
	ZG01	79071265	Front Panel(Silver)	
	ZG03	79071241	Panel,Tray(Silver)	
	ZG20	79073096	Cover,Top(Silver)	
!	ZG27	79070469	Label,Caution	
	ZZ03	79080074	Kit,Data Update	

LOCATION NUMBER	PART NUMBER	DESCRIPTION	
		- ELECTRICAL PARTS -	
EU01	79083125	PC Board Assy	Main
		- INTEGRATED CIRCUITS -	
IC301	79040326	IC	ZR36732
IC302	79040362	IC	MM1561KFBE
IC304	79040363	IC	MM1567AJBE
IC305	79040163	IC	MT48LC1M16A1TG
IC306	79040163	IC	MT48LC1M16A1TG
IC401	79040282	IC	TC94A03F
IC402	79040323	IC	M11B11664A-30T
IC502	79040296	IC	TA1323F
IC503	79040324	IC	BA5813FM-E2
IC530	79040014	IC	TA75S01F
IC601	79040226	IC	S-24C01BFJ-TB-0
IC602	79040007	IC	TC7S08F
IC603	79040323	IC	M11B11664A-30T
IC604	79040364	IC	PST3545NR
IC605	79040322	IC	TMP94C251AF
IC606	79040153	IC	MBM29F800BA55TN
IC608	79040007	IC	TC7S08F
IC611	79040007	IC	TC7S08F
IC901	79040106	IC	TC7SU04F
IC902	79040107	IC	TC7WU04F
IC903	79040249	IC	TC7SH08FU
IC912	79040044	IC	NJM4580E
IC914	79089024	Terminal,Optical	TOTX178
IC915	79040365	IC	AD1958YRS
		- TRANSISTORS -	
Q301	79050019	Transistor,Chip	2SA1182
Q302	79050018	Transistor,Chip	2SA1162
Q303	79050018	Transistor,Chip	2SA1162
Q304	79050016	Transistor,Chip	2SC2712
Q306	79050018	Transistor,Chip	2SA1162
Q307	79050018	Transistor,Chip	2SA1162
Q401	79050085	Transistor,Chip	2SC3326-B
Q501	79050015	Transistor,Chip	HN1B01F
Q502	79050015	Transistor,Chip	HN1B01F
Q503	79050079	Transistor,Chip	2SA1213-Y
Q504	79050043	Transistor,Chip	RN1402
Q505	79050014	Transistor,Chip	HN1C03F
Q530	79050085	Transistor,Chip	2SC3326-B
Q601	79050031	Transistor,Chip	DTA114EKA
Q602	79050031	Transistor,Chip	DTA114EKA
Q603	79050001	Transistor,Chip	RN2402
Q604	79050043	Transistor,Chip	RN1402
Q901	79050001	Transistor,Chip	RN2402
Q902	79050043	Transistor,Chip	RN1402
Q903	79050001	Transistor,Chip	RN2402
Q904	79050001	Transistor,Chip	RN2402
Q906	79050001	Transistor,Chip	RN2402
Q909	79050016	Transistor,Chip	2SC2712
Q910	79050014	Transistor,Chip	HN1C03F
Q913	79050018	Transistor,Chip	2SA1162
Q914	79050043	Transistor,Chip	RN1402
		- DIODES -	
D501	79060022	Diode,Chip	1SS368
D502	79060022	Diode,Chip	1SS368
D901	79060022	Diode,Chip	1SS368
		- MISCELLANEOUS -	
J301	79089094	Plate,Jack	
X601	79089022	Oscillator,Ceramic	9.00MHz
X901	79089166	Oscillator,Crystal	27MHz
! EU02	79085102	PC Board Assy	Power
		- INTEGRATED CIRCUITS -	
! Q802	79040327	IC	TA1319AP
Q821	79040146	IC	TA76431S
		- TRANSISTORS -	
! Q801	79050095	Transistor	FS5KM-16A
! Q803	79050044	Photo Coupler	TLP621
! Q804	79050044	Photo Coupler	TLP621
Q823	79050076	Transistor	2SA1585STP-Q
Q824	79050077	Transistor	2SC1740STP-Q
Q825	79050005	Transistor	2SC2236-Y
Q826	79050005	Transistor	2SC2236-Y
Q827	79050077	Transistor	2SC1740STP-Q
Q828	79050076	Transistor	2SA1585STP-Q
Q829	79050040	Transistor	2SA1048-Y
Q830	79050008	Transistor	RN1201

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
		- DIODES -		
! D803	79060087	Diode	S1WB(A)60	
D805	79060069	Diode	HER108G	
D806	79060070	Diode	HT15G	
D807	79060080	Diode	AK06	
D808	79060029	Diode,Zener	6.8V	
D821	79060071	Diode	HER152G	
D822	79060017	Diode	RU4Z	
D823	79060089	Diode	HT16G	
D825	79060070	Diode	HT15G	
! D826	79060072	Diode	1N4005S	
! D827	79060072	Diode	1N4005S	
! D828	79060072	Diode	1N4005S	
! D829	79060072	Diode	1N4005S	
D830	79060015	Diode	1SS133	
D831	79060007	Diode,Zener	UZ3.0BSB	
D832	79060034	Diode,Zener	MTZJT-77-10B	
D833	79060034	Diode,Zener	MTZJT-77-10B	
D834	79060068	Diode,Zener	MTZJT-77-8.2B	
D835	79060004	Diode,Zener	UZ5.1BSB	
D836	79060005	Diode,Zener	UZ11BSB	
D837	79060005	Diode,Zener	UZ11BSB	
! D839	79060072	Diode	1N4005S	
		- COILS -		
L801	79010024	Coil,Choke	ZBF253D00	
		- CAPACITORS -		
! C801	79020196	Cap,Film	0.22MF	M 275V
! C802	79020198	Cap,Film	10000pF	M 275V
! C803	79020028	Cap,Ceramic	470pF	Z 250V
! C804	79020028	Cap,Ceramic	470pF	Z 250V
! C811	79020193	Cap,Ceramic	220pF	K 250V
		- RESISTORS -		
! R801	79030055	Res,Oxide Metal	1Mohm	J 1/2W
		- MISCELLANEOUS -		
! F801	79087012	Fuse	1.6A,250V	
! P802	79089029	Jack	AC Inlet	
! RF835	79030015	Res,Fusible	2.2ohm	J 1/4W
! T801	79010025	Line Filter	183Y0R5	
! T802	79010026	Power Transformer	SRW3020ED5-210	
EU03	--------	PC Board Assy	Front	
		- INTEGRATED CIRCUITS -		
IC101	79040394	IC	TMP86CK74AFG-3PV7	
		- TRANSISTORS -		
Q181	79050001	Transistor,Chip	RN2402	
Q182	79050001	Transistor,Chip	RN2402	
		- DIODES -		
D181	79060033	Diode,LED		
		- MISCELLANEOUS -		
A101	79089167	Display,FL	8-BT-230GNK	
MT101	79089146	Module,RMT	GP1U261XK	
S103	79089020	Switch	Push	
S104	79089020	Switch	Push	
S105	79089020	Switch	Push	
S106	79089020	Switch	Push	
S107	79089020	Switch	Push	
S108	79089020	Switch	Push	
S120	79089020	Switch	Push	
S181	79089020	Switch	Push	
X101	79089095	Oscillator,Ceramic	8MHz	

SPECIFICATIONS

DVD Video Player/Outputs/Supplied Accessories

[DVD Video Player]

Power supply	100-240V AC, 50/60 Hz
Power consumption	16 VA
Mass	2.3 kg
External dimensions	430 x 69 x 224 mm (W/H/D)
Signal system	PAL/3.58 NTSC
Laser	Semiconductor laser, wavelength 650/780 nm
Frequency range	DVD linear sound : 48 kHz sampling 4 Hz to 22 kHz 96 kHz sampling 4 Hz to 44 kHz
Signal-to-noise ratio	More than 112 dB
Audio dynamic range	More than 108 dB
Harmonic distortion	Less than 0.002%
Wow and flutter	Below measurable level (less than ± 0.001% (W. PEAK))
Operating conditions	Temperature: 5 °C to 35 °C, Operation status: Horizontal

[Outputs]

Video output	1.0 V (p-p), 75 Ω, negative sync., pin jack x 1
S video output	(Y) 1.0 V (p-p), 75 Ω, negative sync., Mini DIN 4-pin x 1 (C) 0.3 V (p-p), 75 Ω
Component video output	(Y) 1.0 V (p-p), 75 Ω, negative sync., pin jack x 1 (P_B)/(P_R) 0.7 V (p-p), 75 Ω, pin jack x 2
Audio output (BITSTREAM/PCM OPTICAL)	Optical connector x 1
Audio output (BITSTREAM/PCM COAXIAL)	0.5 V (p-p), 75 Ω, pin jack x 1
Audio output (ANALOG AUDIO OUT)	2.0 V (rms), 680 Ω, pin jacks (L,R) x 1

[Supplied Accessories]

Audio/video cable 1
Remote control (SE-R0049) 1
Batteries (R6) 2
Power cord 1

* Designs and specifications are subject to change without notice.

TOSHIBA CORPORATION
1–1, SHIBAURA 1– CHOME, MINATO – KU, TOKYO 105 – 8001, JAPAN

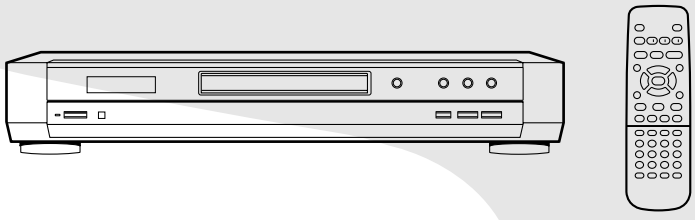
TOSHIBA

FILE NO. 810-200207

SERVICE MANUAL

DVD VIDEO PLAYER

SD-2550A
SD-2550H
SD-2550T



Jun., 2002 Ⓢ

SECTION 3
SERVICING DIAGRAMS

1. STANDING PC BOARDS FOR SERVICING

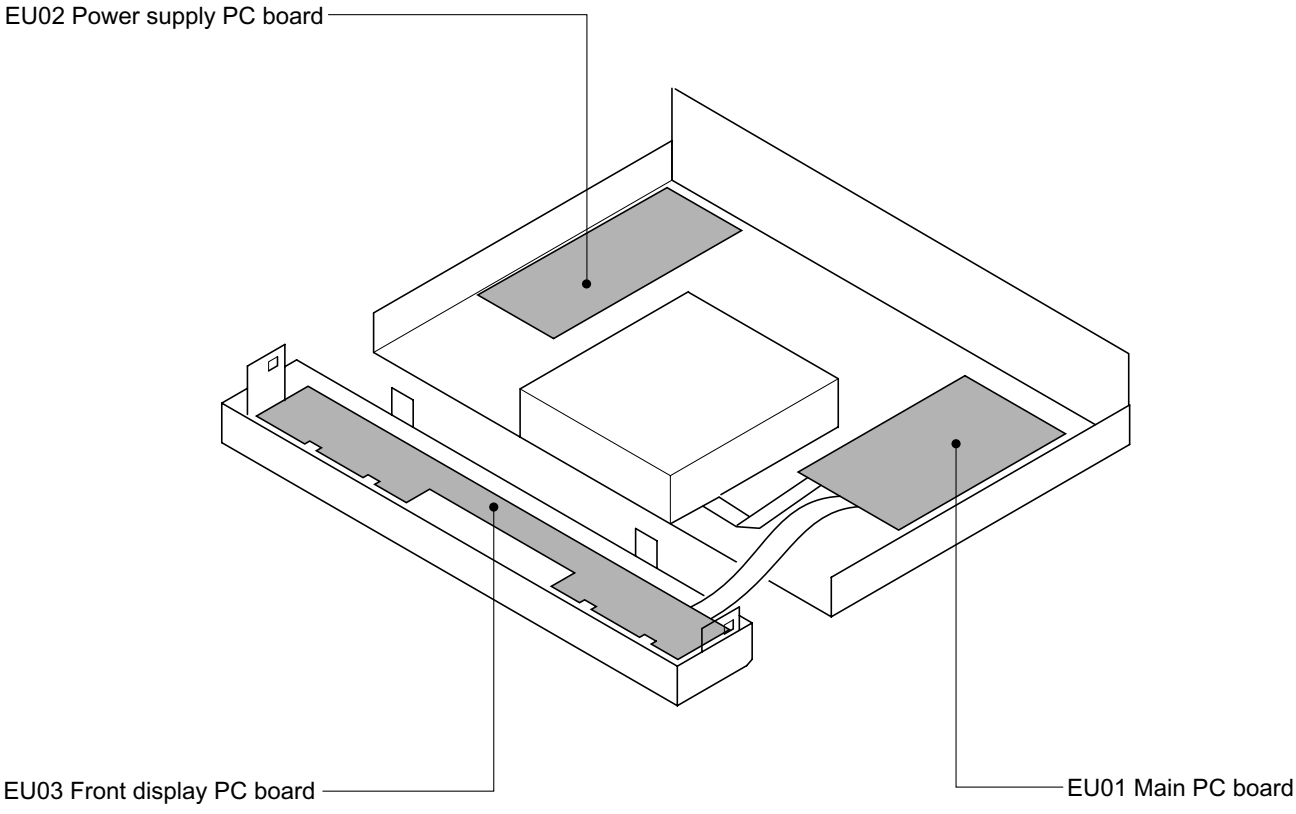


Fig. 3-1-1

2. CIRCUIT SYMBOLS AND SUPPLEMENTARY EXPLANATION

2-1. Precautions for Part Replacement

- In the schematic diagram, parts marked ⚠ (ex. ⚠ F801) are critical part to meet the safety regulations, so always use the parts bearing specified part codes (SN) when replacing them.
- Using the parts other than those specified shall violate the regulations, and may cause troubles such as operation failures, fire etc.

2-2. Solid Resistor Indication

Unit	None .....Ω K .....kΩ M .....MΩ
Tolerance	None .....±5% B .....±0.1% C .....±0.25% D .....±0.5% F .....±1% G .....±2% K .....±10% M .....±20%
Rated Wattage	(1) Chip Parts None .....1/16W (2) Other Parts None .....1/6W Other than above, described in the Circuit Diagram.
Type	None .....Carbon film S .....Solid R .....Oxide metal film W .....Metal film W .....Cement FR .....Fusible

Eg. 1

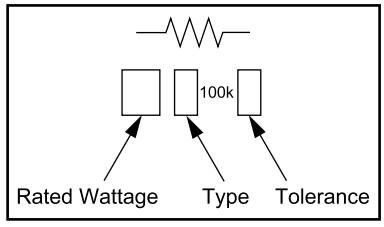


FIg. 3-2-1

2-3. Capacitance Indication

Symbol	.....Electrolytic, Special electrolytic NP .....Non polarity electrolytic .....Ceramic, plastic M .....Film .....Trimmer
Unit	None .....F μ .....μF p .....pF
Rated voltage	None .....50V For other than 50V and electrolytic capacitors, described in the Circuit Diagram.
Tolerance	(1) Ceramic, plastic, and film capacitors of which capacitance are more than 10 pF. None .....±5% or more B .....±0.1% C .....±0.25% D .....±0.5% F .....±1% G .....±2% (2) Ceramic, plastic, and film capacitors of which capacitance are 10 pF or less. None .....more than ±5% pF B .....±0.1 pF C .....±0.25 pF (3) Electrolytic, Trimmer Tolerance is not described.
Temperature characteristic (Ceramic capacitor)	None .....SL For others, temperature characteristics are described. (For capacitors of 0.01 μF and no indications are described as F.)
Static electricity capacity (Ceramic capacitor)	Sometimes described with abbreviated letters as shown in Eg. 3.

Eg. 2

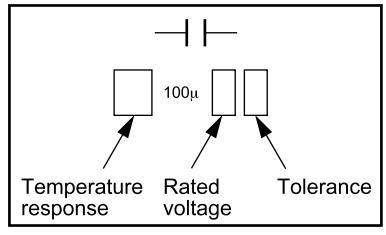


Fig. 3-2-2

Eg. 3

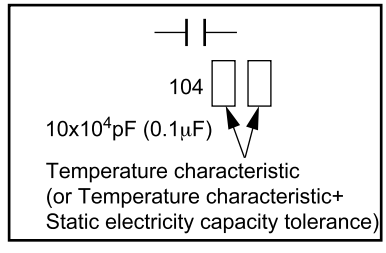


Fig. 3-2-3

2-4. Inductor Indication

Unit	None ..... H μ ..... μH m ..... mH
Tolerance	None .....±5% B .....±0.1% C .....±0.25% D .....±0.5% F .....±1% G .....±2% K .....±10% M .....±20%

Eg. 4

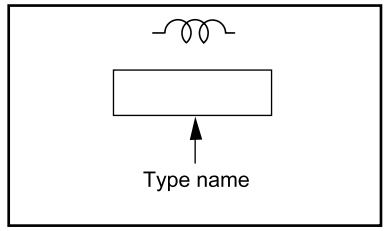


Fig. 3-2-4

2-5. Waveform and Voltage Measurement

- The waveforms for CD/DVD and RF shown in the circuit diagrams are obtained when a test disc is played back.
- All voltage values except the waveforms are expressed in DC and measured by a digital voltmeter.

Eg. 5

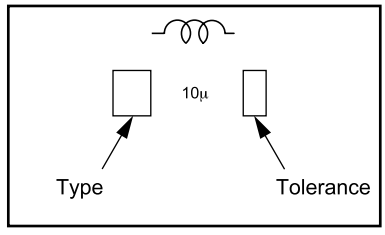


Fig. 3-2-5

2-6. Others

- The parts indicated with "NC" or "KETU" etc. are not used in the circuits of this model.

3. PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

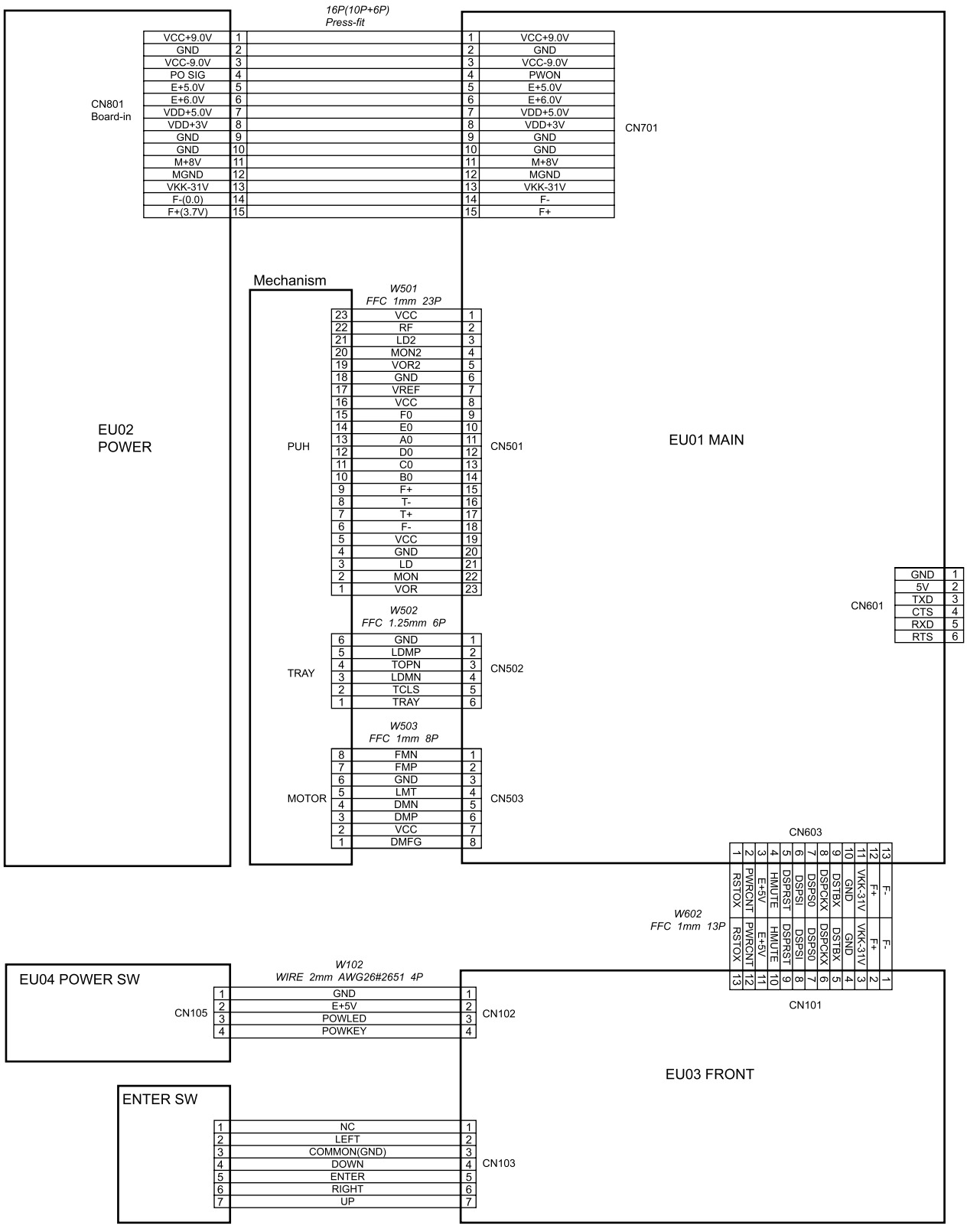


Fig. 3-3-1

4. BLOCK DIAGRAMS

4-1. Overall Block Diagram

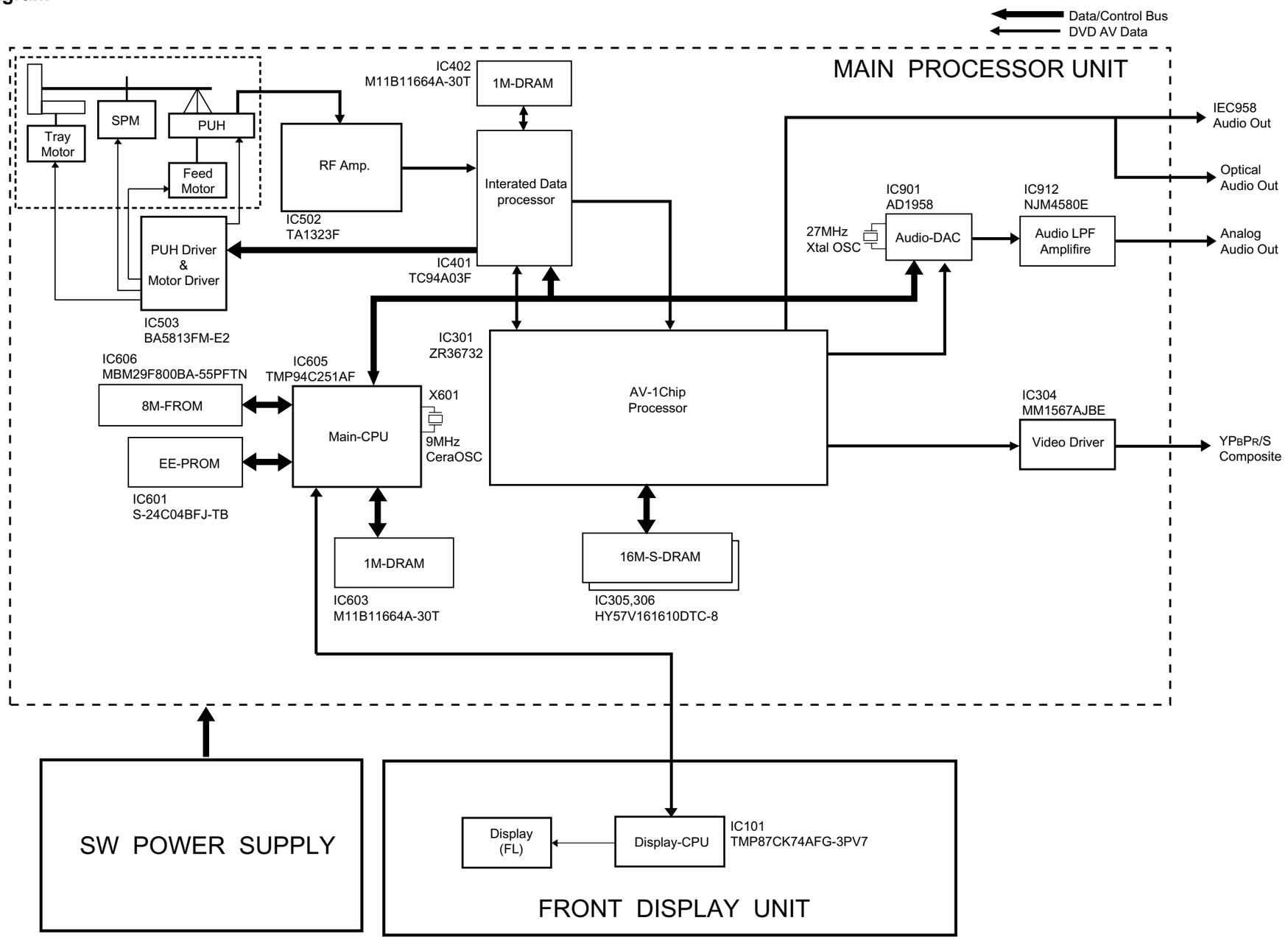


Fig.3-4-1

4-2. Power Supply Block Diagram

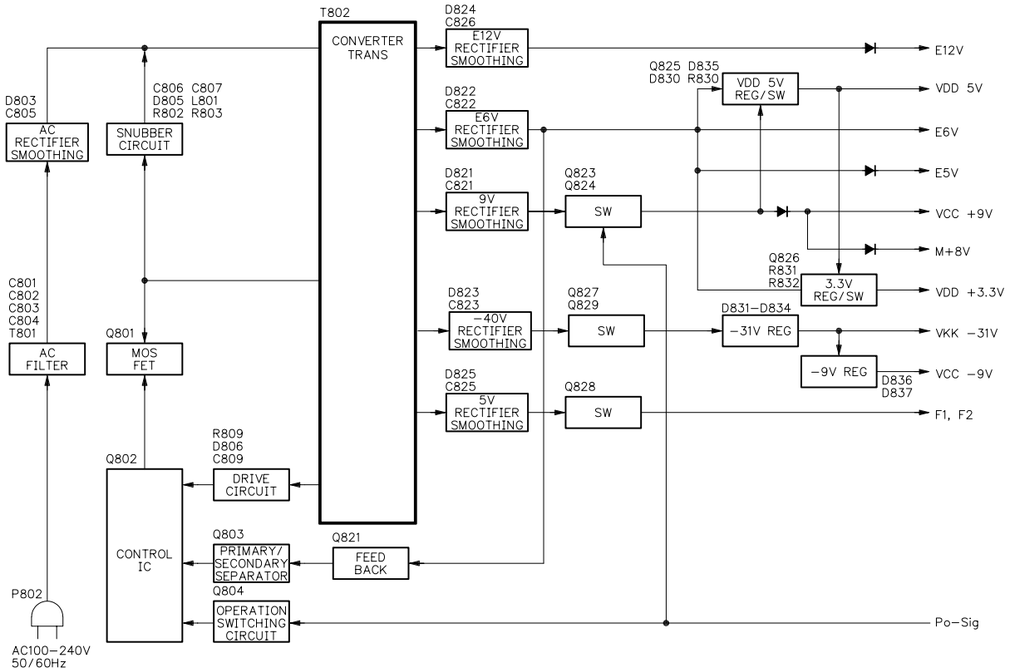


Fig. 3-4-2

4-3. Front Display, Power Switch Block Diagram

4-3-1. Front Display

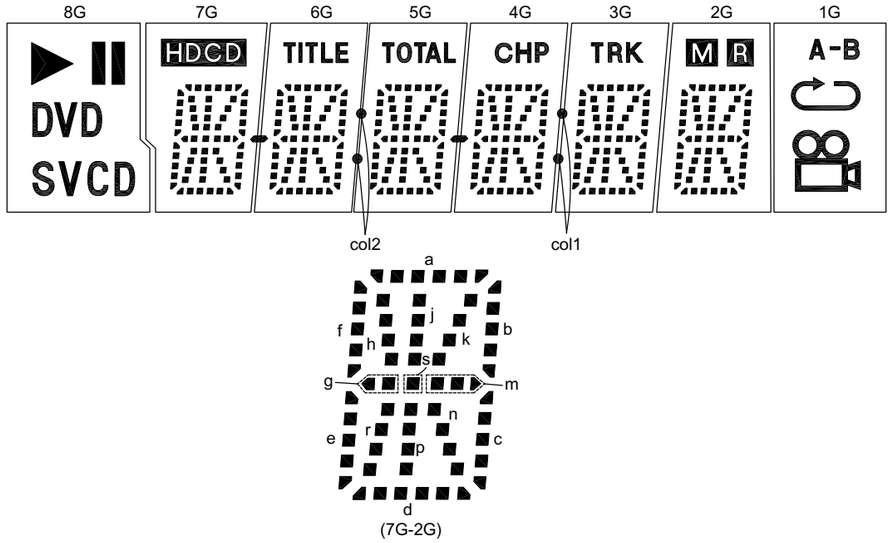


Fig. 3-4-3

4-3-2. Front Display Pattern

	8G	7G	6G	5G	4G	3G	2G	1G
P1	▶	a	a	a	a	a	a	A
P2	❚❚	f	f	f	f	f	f	-B
P3	DVD	h	h	h	h	h	h	
P4	S	j	j	j	j	j	j	
P5	V	k	k	k	k	k	k	–
P6	CD	b	b	b	b	b	b	–
P7	–	g	g	g	g	g	g	–
P8	–	s	s	s	s	s	s	–
P9	–	m	m	m	m	m	m	–
P10	–	e	e	e	e	e	e	–
P11	–	r	r	r	r	r	r	–
P12	–	p	p	p	p	p	p	–
P13	–	n	n	n	n	n	n	–
P14	–	c	c	c	c	c	c	–
P15	–	d	d	d	d	d	d	–
P16	–	–	col2		col1		M	–
P17	–	⬬		⬬		–	R	–
P18	–	HDCD	TITLE	TOTAL	CHP	TRK	–	–

Fig. 3-4-4

4-3-3. Front Display, Power Switch Block Diagram

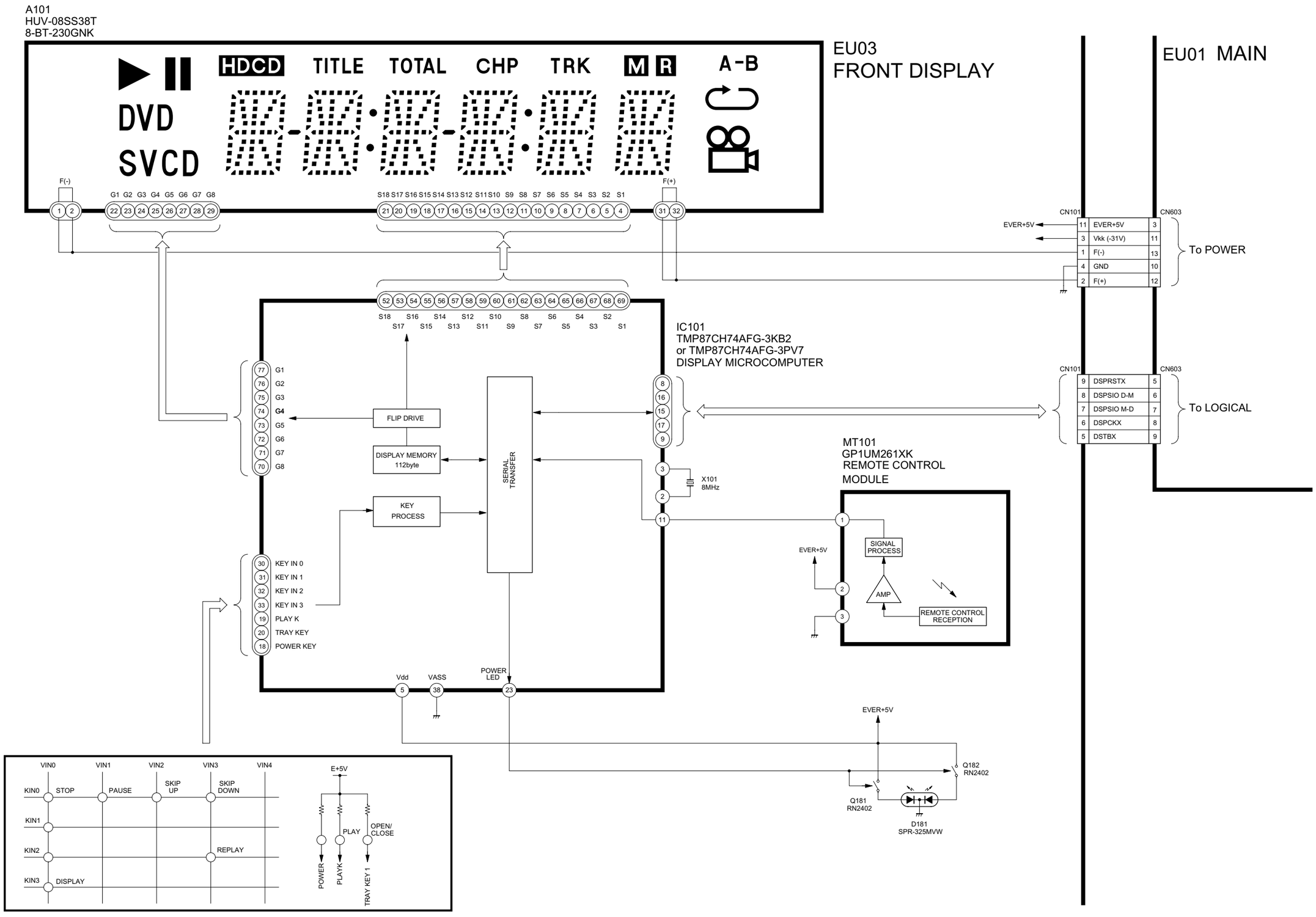


Fig. 3-4-5

4-4. Main Block Diagrams

4-4-1. Servo System Block Diagram

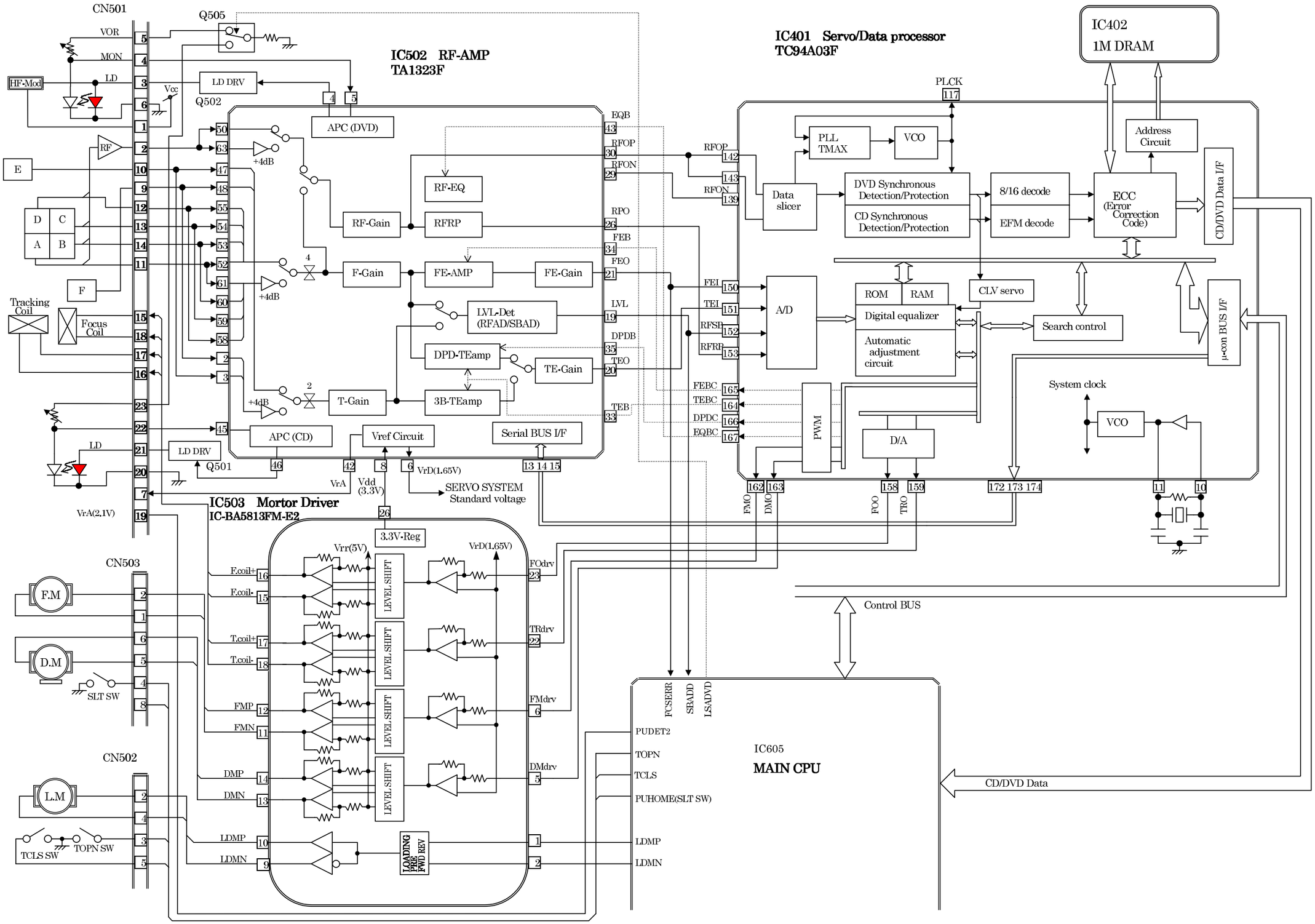


Fig.3-4-6

4-4-2. Logical System Block Diagram

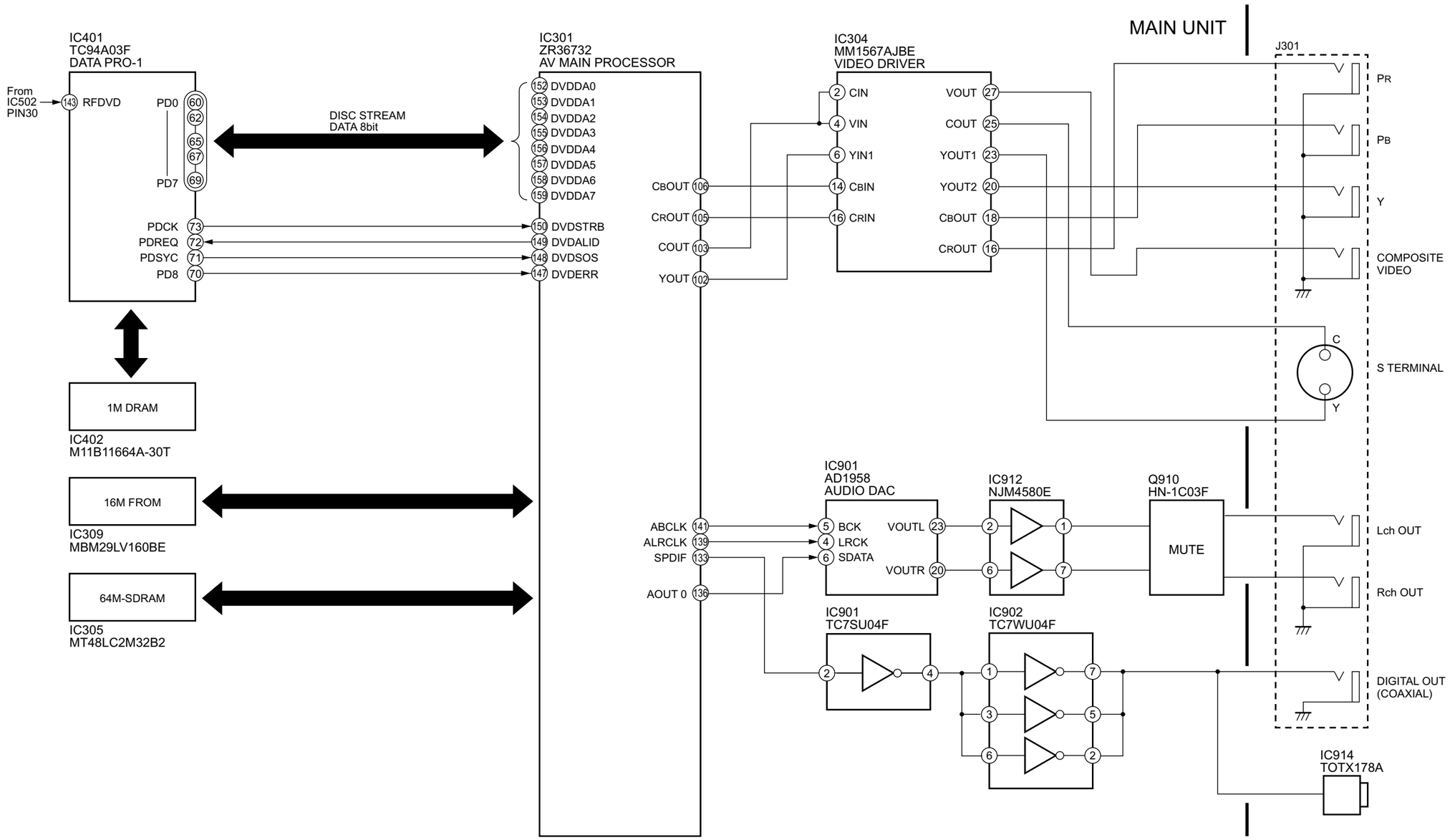
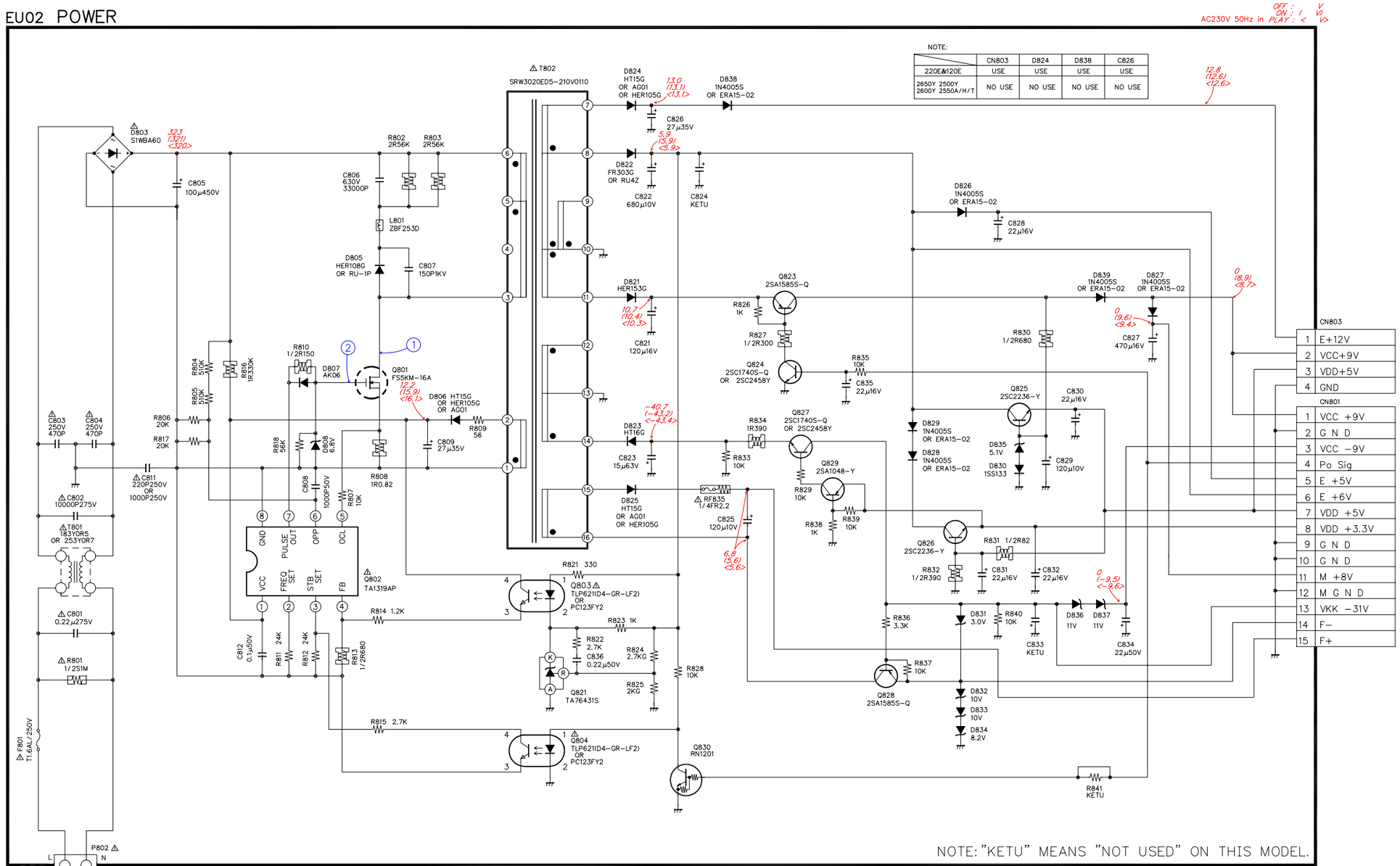


Fig. 3-4-7

5. CIRCUIT DIAGRAMS

5-1. Power Supply Circuit Diagram



(V)

	Q802						Q821			Q823			Q824		
	1	2	3	4	6	8	K	R	A	E	C	B	E	C	B
OFF	12.2	1.5	0.5	2.8	3.0	0	4.0	2.5	0	10.7	0	10.7	0	10.7	0
ON	15.9	1.0	1.7	2.4	3.0	0	4.2	2.5	0	10.4	9.6	9.0	0	0.1	0.7
PLAY	16.1	1.0	1.7	2.3	3.0	0	4.2	2.5	0	10.3	9.4	8.8	0	0.1	0.7

(V)

	Q825			Q826			Q827			Q828			Q829			Q830		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
OFF	0	5.9	0	0	5.8	0	-40.7	0	-40.2	0	-6.7	0	0	-40.0	0	0	1.0	0
ON	5.0	5.9	5.7	3.4	4.4	4.1	-31.4	-31.3	-30.6	-27.7	-27.8	-28.4	2.6	3.3	3.4	0	0	4.8
PLAY	5.0	5.9	5.7	3.3	4.3	4.0	-31.4	-31.3	-30.6	-27.8	-27.9	-28.5	2.7	3.4	3.4	0	0	4.8

Fig. 3-5-1

Power Supply Circuit Diagram

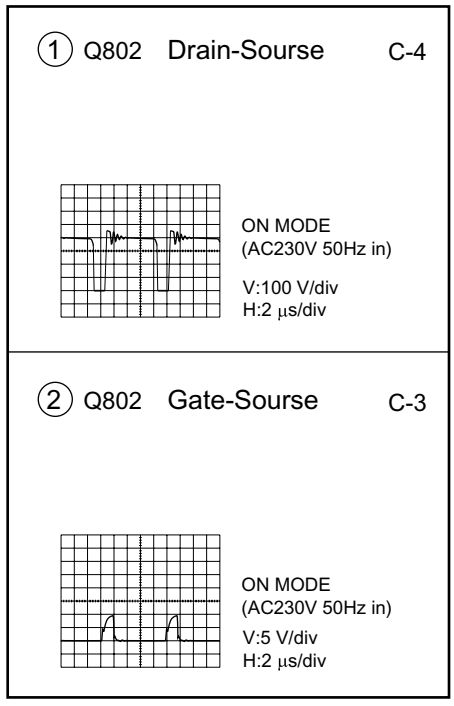
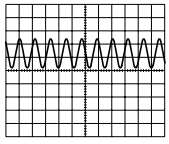


Fig. 3-5-2

5-2. Front Display, Power Switch Circuit Diagram

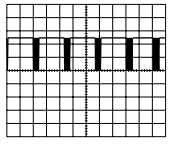
① IC101, Pin ③



X-OUT

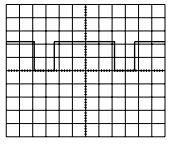
V: 2 V/div
H: 100 ns/div

⑤ IC101, Pin ⑰



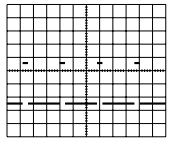
V: 2 V/div
H: 100 μs/div

② IC101, Pin ⑨



V: 2 V/div
H: 5 ms/div

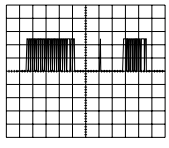
⑥ IC101, Pin ⑦⑦



G1

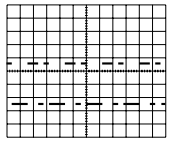
V: 10 V/div
H: 500 μs/div

③ IC101, Pin ⑮



V: 2 V/div
H: 200 ms/div

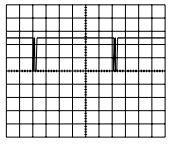
⑦ IC101, Pin ⑥⑨



S1

V: 10 V/div
H: 500 μs/div

④ IC101, Pin ⑯

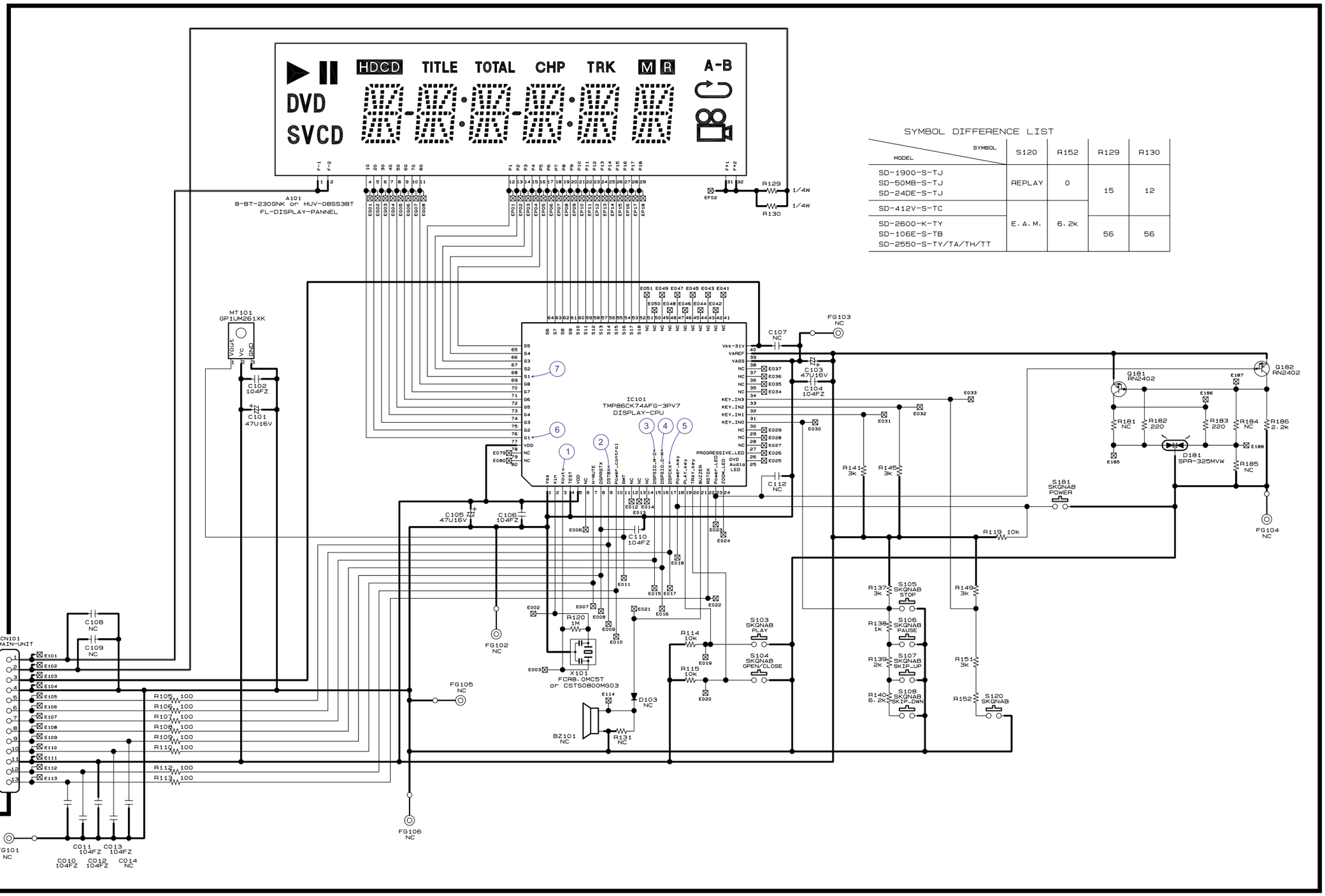


V: 2 V/div
H: 5 ms/div

Fig. 3-5-3

Front Display, Power Switch Circuit Diagram

EU03 FRONT



SYMBOL DIFFERENCE LIST

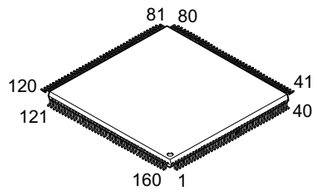
MODEL \ SYMBOL	S120	R152	R129	R130
SD-1900-S-TJ SD-50MB-S-TJ SD-24DE-S-TJ	REPLAY	0	15	12
SD-412V-S-TC	E. A. M.	6.2k		
SD-2600-K-TY SD-106E-S-TB SD-2550-S-TY/TA/TH/TT			56	56

Fig. 3-5-4

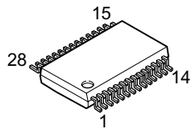
5-3. Main Circuit Diagrams

5-3-1. New Main ICs Information

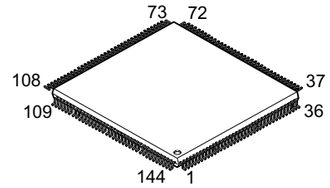
ZR36732



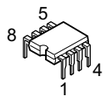
AD1958



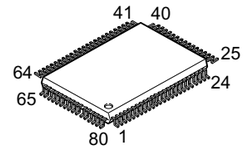
TMP94C251AF(Z)



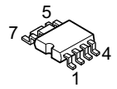
TA1319P/TA1319AP



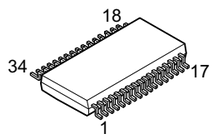
TMP86CK74AFG



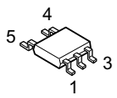
MM1561KFBE



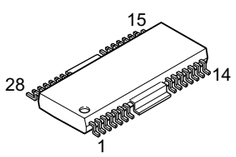
MM1567AJBE



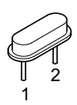
PST3545NR



BA5813FM-E2



HC49US27000B



Main ICs Function

Table 3-5-1

Ref. No.	IC Name	Function	Detail
IC601	S-24C04BFJ-TB	EE-PROM	Setup default, memorization of specification setting.
IC301	ZR36732	AV Decorder	Decryption, MPEG-2 Decode, Audio Decode, Sub Picture Decode, OSD.
IC401	TC94A03F	SERVO & Data Processor	Performs servo control of DVD or CD, and performs demodulation and correction of RF signal.
IC502	TA1323F	RF Signal processing IC	Equalizes playback RF signal and generates error detection signal required for each servo operation.
IC503	BA5813FM-E2	Motor Driver	Driver for motor driving.
IC901	AD1958	DA Converter	Stereo audio DA converter.
IC605	TMP94CS251AF	Main Micro Processor	Performs system control for all circuits.
IC606	MBM29F800BA-55PFTN	Flash ROM	Memorization for firmware.

Table 3-5-2 AD1958

Pin No.	Name	Function
1	CCLK	Control clock input for control data. Control input data must be valid on the rising edge of CCLK. CCLK may be continuous or gated.
2	$\overline{\text{CLATCH}}$	Latch input for control data. This input is active low.
3	$\overline{\text{RESET}}$	Reset. The AD1958 is placed in reset mode when this pin is held LO. The serial control port registers are reset to the default values. Connect HI for normal operation.
4	LRCLK	Left/Right clock input for input data. Must run continuously.
5	BCLK	Bit clock input for input data. Need not run continuously; may be gated or used in a burst fashion.
6	SDATA	Serial inout, MSB first,containing two channels of 16/20/24 bits of twos compliment data per channel.
7	DVDD	Digital Power Supply Connect to digital+5V supply.
8	DGND	Digital Ground
9	SCLK0	33.8688 MHZ clock output
10	SCLK1	256/384 fs output
11	SCLK2	512 fs/22.5792 MHZ output
12	MCLK	27 MHZ master clock output/256 fs DAC clock input
13	XOUT	27 MHZ Crystal Oscillator output
14	XIN	27 MHZ Crystal Oscillator /External Clock Input
15	PVDD	PLL Power Supply. Connect to PLL +5V supply.
16	PGND	PLL Ground
17	LF0	PLL0 loop filter
18	LF1	PLL1 loop filter
19	AGND	Analog Ground
20	OUTR	Right Channel Positive line level analog output.
21	FILTR	Voltage Reference Filter Capacitor connection.Bypass and decouple the voltage reference with parallel 10µF and 0.1µF capacitors to AGND.
22	AGND	Analog Ground
23	OUTL	Left Channel line level analog output
24	AVDD	Analog Power Supply. Connect to analog+5V supply.
25	FILTB	Filter Capacitor connection, connect 10µF capacitor to AGND.
26	ZERO	Zero Flag output.This pin goes HI when both channels have zero signal input for more than 1024 LR Clock Cycles.
27	MUTE	Mute. Assert HI to mute both stereo analog outputs. Deassert LO for normal operation.
28	CDATA	Serial control input, MSB first,containing 16 bits of unsigned data per channel. Used for specifying channel specific attenuation and mute.

Table 3-5-3 BA5813FM-E2

Pin No.	Name	Function
1	FWD	Loading driver FWD input terminal
2	REV	Loading driver REV input terminal
3	LDCONT	Loading driver output voltage control terminal
4	MUTE1	CH1 mute terminal
5	IN1	Driver CH1 input terminal
6	IN2	Driver CH2 input terminal1
7	PREVcc	Pre driver, Loading power supply terminal
8	POWVcc12	CH1, CH2 power step power supply terminal
9	VOL(-)	Loading driver minus output
10	VOL(+)	Loading driver plus output
11	VO2(-)	Driver CH2 minus output
12	VO2(+)	Driver CH2 plus output
13	VO1(-)	Driver CH1 minus output
14	VO1(+)	Driver CH1 plus output
15	VO4(+)	Driver CH4 plus output
16	VO4(-)	Driver CH4 minus output
17	VO3(+)	Driver CH3 plus output
18	VO3(-)	Driver CH3 minus output
19	GND	Ground terminal
20	POWVcc34	CH3, CH4 power step power supply terminal
21	MUTE2	CH2, CH3, CH4 mute terminal
22	IN3	Driver CH3 input terminal
23	IN4	Driver CH4 input terminal
24	RGND	Regulator part ground terminal
25	REG-P	Regulator output feedback terminal
26	REG-B	External regulator Tr base connection terminal
27	RVcc	Regulator part power supply terminal
28	BIAS	Bias input terminal

Note: Plus and minus outputs are the polarity against the Input.
(Ex. Pin 14 becomes HIGH, when pin 4 terminal voltage is HIGH.)

Table 3-5-4 TMP94C251AF(Z) (1/5)

Pin No.	Name	Function
70 | 77	P00~P07 D0~D7	Port 0: I/O port Data 0~7: data bus 0~7 Initialized to this function in the external ROM type, TMP94C251A. Becomes high impedance when not accessing to the external memory.
79 | 86	P10~P17 D8~D15	Port 1: I/O port Data 8~15: data bus 8~15 Initialized to this function when starting with data bus width higher than 16 bit in the external ROM type, TMP94C251A. Becomes to high impedance when not accessing to the external memory.
108 | 115	P40~P47 A0~A7	Port 4: I/O port Address 0~7: address bus 0~7 Initialized to this function in the external ROM type, TMP94C251A. The signal does not change when not accessing to the external memory.
99 | 106	P50~P57 A8~A15	Port 5: I/O port Address 8~15: address bus 8~15 Initialized to this function in the external ROM type, TMP94C251A. The signal does not change when not accessing to the external memory.
90 | 97	P60~P67 A16~A23	Port 6: I/O port Address 16~23: address bus 16~23 Initialized to this function in the external ROM type, TMP94C251A. The signal does not change when not accessing to the external memory.
68	P70 $\overline{RD}$	Port 70: Output port (initialized to “1” output) Read: Strobe signal, which reads the external memory. Develops no strobe signal when not accessing to the external memory. Initialized to this function in the external ROM type, TMP94C251A.
67	P71 $\overline{WRL}$	Port 71: Output port (initialized to “1” output) Write: Strobe signal, which writes D0 ~ D7 of the external memory. Develops no strobe signal when not accessing to the external memory.
66	P72 $\overline{WRH}$	Port 72: Output port (initialized to “1” output) Write: Strobe signal, which writes D8 ~ D15 of the external memory. Develops no strobe signal when not accessing to the external memory.
65	P73	Port 73: Output port (initialized to “1” output)
64	P74	Port 74: Output port (initialized to “1” output)
63	P75 $\overline{BUSRQ}$	Port 75: I/O port Bus request: Signal, which requests to set the memory interface terminal to high impedance. The following terminals become high impedance. But the state does not change while functioning as port. A0~A23, D0~D15, $\overline{RD}$, $\overline{WRLL}$, $\overline{WRLH}$, $\overline{CS0}$~$\overline{CS5}$, $\overline{OE0}$~$\overline{OE1}$, $\overline{WE0}$~$\overline{WE1}$, $\overline{RAS}$ group, $\overline{CAS}$ group
62	P76 $\overline{BUSAK}$	Port 76: Output port (initialized to “1” output) Bus Acknowledge: Signal, which indicates that $\overline{BUSRQ}$ request is received.
60	P80 $\overline{CS0}$	Port 80: Output port (initialized to “1” output) Chip select 0: Develops “L” level when the address is within the assigned address area.

Table 3-5-4 TMP94C251AF(Z) (2/5)

Pin No.	Name	Function
59	P81 $\overline{CS1}$ $\overline{RAS0}$	Port 81: Output (initialized to “1” output) Chip select 1: Develops “L” level when the address is within the assigned address area. Low address strobe 0: Develops $\overline{RAS}$ strobe signal for DRAM when the address is within the assigned address area.
58	P82 $\overline{CS2}$	Port 82: Output port (initialized to “1” output) Chip select 2: Develops “L” level when the address is within the assigned address area.
57	P83 $\overline{CS3}$ $\overline{RAS1}$	Port 83: Output port (initialized to “1” output) Chip select 3: Develops “L” level when the address is within the assigned address area. Low address strobe 1: Develops $\overline{RAS}$ strobe signal for DRAM when the address is within the assigned address area.
56	P84 $\overline{CS4}$	Port 84: Output port (initialized to “1” output) Chip select 4: Develops “L” level when the address is within the assigned address area.
55	P85 $\overline{CS5}$	Port 85: Output port (initialized to “1” output) Chip select 5: Develops “L” level when the address is within the assigned address area.
29	P86 $\overline{WAIT}$	Port 86: I/O port Wait: Bus wait request signal
49	PA0 $\overline{CAS0}$ $\overline{LCAS0}$	Port A0: Output port (initialized to “1” output) Column address strobe 0: Develops $\overline{CAS}$ strobe signal for DRAM when the address is within the assigned address area. Lower column address strobe 0: Develops lower $\overline{CAS}$ strobe signal for DRAM when the address is within the assigned address area.
50	PA1 $\overline{UCAS0}$	Port A1: Output port (initialized to “1” output) Upper column address strobe 0: Develops upper $\overline{CAS}$ strobe signal for DRAM when the address is within the assigned address area.
51	PA2 $\overline{OE0}$	Port A2: Output port (initialized to “1” output) Out enable 0: Develops out enable signal for DRAM.
52	PA3 $\overline{OE1}$	Port A3: Output port (initialized to “1” output) Out enable 1: Develops out enable signal for DRAM.
53	PA4 $\overline{WE0}$	Port A4: Output port (initialized to “1” output) Write enable 0: Develops write enable signal for DRAM.
44	PB0 $\overline{CAS1}$ $\overline{LCAS1}$	Port B0: Output port (initialized to “1” output) Column address strobe 1: Develops $\overline{CAS}$ strobe signal for DRAM when the address is within the assigned address area. Lower column address strobe 1: Develops lower $\overline{CAS}$ strobe signal for DRAM when the address is within the assigned address area.
45	PB1 $\overline{UCAS1}$	Port B1: Output port (initialized to “1” output) Upper column address strobe 1: Develops upper $\overline{CAS}$ strobe signal for DRAM when the address is within the assigned address area.

Table 3-5-4 TMP94C251AF(Z) (3/5)

Pin No.	Name	Function
46	PB2	Port B2: Output port (initialized to “1” output)
47	PB3	Port B3: Output port (initialized to “1” output)
48	PB4 WE1	Port B4: Output port (initialized to “1” output) Write enable 1: Develops write enable signal for DRAM.
6	PC0 TO1 TO7	Port C0: I/O port Timer output 1: Develops 8 bit timer 0 or timer 1. Timer output 7: Develops 16 bit timer 7.
7	PC1 TO3 TOB	Port C1: I/O port Timer output 3: Develops 8 bit timer 2 or timer 3. Timer output B: Develops 16 bit timer B.
8	PD0 TO4	Port D0: I/O port Timer output 4: Develops 16 bit timer 4.
9	PD1 TI4 INT4	Port D1: I/O port Timer input 4: Enters 16 bit timer 4. Interrupt request terminal 4: Terminal for interrupt request signal of which rising/ falling edge is programmable.
10	PD2 TI5 INT5	Port D2: I/O port Timer input 5: Enters 16 bit timer 4. Interrupt request terminal 5: Terminal for interrupt request signal at the rising edge.
11	PD4 TO6	Port D4: I/O port Timer output 6: Enters 16 bit timer 6.
12	PD5 TI6 INT6	Port D5: I/O port Timer input 6: Enters 16 bit timer 6. Interrupt request terminal 6: Terminal for interrupt request signal of which rising/ falling edge is programmable.
13	PD6 TI7 INT7	Port D6: I/O port Timer input 7: Enters 16 bit timer 6. Interrupt request terminal 7: Terminal for interrupt request signal at the rising edge.
15	PE0 TO8	Port E0: I/O port Timer output 8: Enters 16 bit timer 8.
16	PE1 TI8 INT8	Port E1: I/O port Timer input 8: Enters 16 bit timer 8. Interrupt request terminal 8: Terminal for interrupt request signal of which rising/ falling edge is programmable.
17	PE2 TI9 INT9	Port E2: I/O port Timer input 9: Enters 16 bit timer 8. Interrupt request terminal 9: Terminal for interrupt request signal at the rising edge.
18	PE4 TOA	Port E4: I/O port Timer output A: Develops 16 bit timer A.
19	PE5 TIA INTA	Port E5: I/O port Timer input A: Enters 16 bit timer A. Interrupt request terminal A: Terminal for Interrupt request signal of which rising/ falling edge is programmable.
20	PE6 TIB INTB	Port E6: I/O port Timer input B: Enters 16 bit timer A. Interrupt request terminal B: Terminal for interrupt request signal at the rising edge.
21	PF0 TXD0	Port F0: I/O port Serial transmission data 0 (open drain output is possible)
22	PF1 RXD0	Port F1: I/O port Serial reception data 0
23	PF2 CTS0 SCLK0	Port F2: I/O port Serial transmission is possible 0 Serial clock I/O 0

Table 3-5-4 TMP94C251AF(Z) (4/5)

Pin No.	Name	Function
24	PF4 TXD1	Port F4: I/O port Serial transmission data 1 (open drain output is possible)
25	PF5 RXD1	Port F5: I/O port Serial reception data 1
26	PF6 CTS1 SCLK1	Port F6: I/O port Serial transmission is possible 1 Serial clock I/O 1
131 | 138	PG0~PG7 AN0~AN7	Port G: Input port Analog input: Enters 10 bit AD converter
3	DAOUT0	DA output 0: Develops 8 bit DA converter 0
4	DAOUT1	DA output 1: Develops 8 bit DA converter 1
126	PH0 TC0	Port H0: I/O port Terminal count 0: Develops “H” level with strobe when micro DMA channel 0 counts 0.
127	PH1 TC1	Port H1: I/O port Terminal count 1: Develops “H” level with strobe when micro DMA channel 1 counts 0.
128	PH2 TC2	Port H2: I/O port Terminal count 2: Develops “H” level with strobe when micro DMA channel 2 counts 0.
129	PH3 TC3	Port H3: I/O port Terminal count 3: Develops “H” level with strobe when micro DMA channel 3 counts 0.
125	PH4 INT0	Port H4: I/O port (schmitt input) Interrupt request terminal 0: Terminal for interrupt request signal of which rising/ falling edge is programmable. (schmitt input)
117 | 124	PZ0~PZ7	Port Z: I/O port
28	$\overline{NMI}$	Non maskable interrupt request terminal: Terminal for interrupt request signal at the falling edge. Depending on the program, interrupt request signal at rising edge may be used. (schmitt input)
42	$\overline{WDTOUT}$	Watch dog timer output terminal
30, 40	AM0~1	Address mode: Selects the starting external data bus width after releasing the reset AM1 = “0”, AM0=”0”: starting at the 8 bit external data bus AM1 = “0”, AM0=”1”: starting at the 16 bit external data bus AM1 = “1”, AM0=”0”: Do not set. AM1 = “1”, AM0=”1”: Do not set.
32, 33	TEST0~1	Test: Used to “GND”
31	CLK	Clock: Develops System clock
38, 39	X1/X2	Oscillator connection terminal
41	$\overline{RESET}$	Reset: Device is initialized. (With the pull-up resistance) (schmitt input)
139	VREFH	Reference voltage input terminal for 10 bit AD converter (H)
140	VREFL	Reference voltage input terminal for 10 bit AD converter (L)
1	DAREFH	Reference voltage input terminal for 8 bit DA converter (H)
2	DAREFL	Reference voltage input terminal for 8 bit DA converter (L)

Table 3-5-4 TMP94C251AF(Z) (5/5)

Pin No.	Name	Function
142	ADVCC	10 bit AD converter power supply terminal
141	ADVSS	10 bit AD converter GND terminal (0V)
144	DAVCC	8 bit DA converter power supply terminal
143	DAVSS	8 bit DA converter GND terminal (0V)
36	CLVCC	Power supply terminal for clock doubler.
34	CLVSS	GND terminal for clock doubler.
5, 27, 43, 61, 78, 88, 98, 116	DVCC	Digital power supply terminal (+5V)
14, 37, 54, 69, 87, 89, 107, 130	DVSS	Digital GND terminal (0V)

Table 3-5-5 ZR36732 (1/5)

Pin No.	Name	Function
Host interface, CD-DSP interface, sub code interface (32 pins)		
124	RESET#	Reset input (active: low). Initializing process of the device will start when deasserting is performed after asserting.
122	STDBY#	Standby input (active: low). When asserting in accordance with RESET#, all the output pins and bidirectional pins enter the float state, and the device is electrically cut off. All internal operations stop and the power consumption can be minimized. At standby, contents of SDRAM and setup parameters are not preserved.
160	IDLE	Display output of Idle, Init or Reset state (active high). After reset, the device enters the active state.
2	HWID	Determines the data bus width of host interface. Only during reset, modification will be available. At low level (GNDP), the host interface of the device is set to 2 or 8 bit width, at high level (VDDP) is set to 16 bit width.
1	HORD	Determines the bite order of host interface data bus at 16 bit width (HWID is VDDP). Only during reset, modification will be available. Sets the device so that m.s. bite is entered/developed by HD [15:8] at low level (GNDP), and m.s. bite is done by HD [7:0] at high level (VDDP). Connects to GNDP when HWID is at GND level.
4	HTYPE	Determines protocol of the host bus. Only during reset, modification will be available. Sets the device to type A at low level (GNDP) and type B at high level (VDDP).
20 | 25, 17, 18	HD[7:0] (HD[7:4]) (HD[3]) (HD[2:1]) (HD[0])	8 l.s of the host data bus. When connecting HWID input to GNDP, only the 8 l.s. signal is defined as a host data signal. When connecting HWID to VDDP, the connection is used as a 8 l.s. line of 16 bit data bus.
9, 11, 13, 15	HD[11:8] (HD[11]) (HD[10:8])	When connecting HWID to VDDP, the connection is used as 11:8 data line of 16 bit host data bus.
	HD[15:12]	When connecting HWID to VDDP, the connection is used as 15:12 data line of 16 bit host data bus. When connecting HWID to GNDP, the connection is used as CD-DSP serial input port pin as defined below.
8	CDCLK (HD[12])	CD-DSP bit clock input.
7	CDDAT (HD[13])	CD-DSP data input.
6	CDFRM (HD[14])	CD-DSP LR clock (Frame) input.
5	CDERR (HD[15])	CD-DSP data error input.
27 | 30	HA[3:0]	Host address input. Inputs address signal which specifies the physical address of the device.
32	HCS#	Host chip select input. Active: low.
31	HWR# (HR/W#)	Host protocol type A (HTYPE=GNDP): HR/W#. The input to determine the direction of host access. Host protocol type B (HTYPE=VDDP): HWR#. Host write input (Active: low).
34	HRD# (HDS#)	Host protocol type A (HTYPE=GNDP): HDS#. Data strobe input (Active: low). Host protocol type B (HTYPE=VDDP): HRD#. Host read in input (Active: low).

Table 3-5-5 ZR36732 (2/5)

Pin No.	Name	Function
36	HRDY	Host ready output (active: high). When transmitting a stream through host bus with this signal, use the signal. And an external pull up resistor is required. Confirm the signal becomes active before transmitting every packet signal, 1 packet signal is CodBurstLen byte length transmission signal. After that, it is available to write the bit stream signals up to the CodBurstLen byte to the device continuously.
37	HIRQ#	Interrupt request (active: low). Deasserted by host reading the interrupt status resistor of the device. And also deasserted either after host masks the interruption with the interrupt mask resistor of the device or after reset. When HIRQ# is not asserted, 3-state status starts. (External pull up resistor is required.)
39	HACK#	Host aknowledge output (active: Low). When the type A protocol is used, the device asserts the output and informs the completion of read/write cycle. When the signal is not active, 3-state status starts. (External pull up resistor is required.) When the type B protocol is used, the signal works as a Wait output signal. When using a host with high speed (microprocessor), the signal connection is not always required.
GPI/O signal (3 pins)		
134	GPIO	General bidirectional pin to watch/control by ADP micro code. After reset, the pin is defined to use for input. By the ADP command, setting is available.
145	GPSI	General input to be watched by DVP micro code.
143	GPSO	General output to be controlled by DVP micro code. After reset, the pin develops Low.
PLL signal (5 pins)		
120	GCLK	27.000 MHz clock or X'tal input for main processor.
117	GCLK1	27.000 MHz master clock input for audio. In standard use, the pin should be connected to GCLK.
119	XO	Output to X'tal connected to GCLK. When not using X'tal for GCLK, XO is kept unconnected.
118 115	PLLCFG [1:0]	PLL configuration input. During reset, modification will be available. For general use, both pins should be connected to GNDP.
Analog video port (7 pins)		
102	CVBS/G/Y (DAC A)	At CVBS, the composite video signal is developed. At RGB, G signal is developed. At YUV, Y signal is developed.
105	Y/R/V (DAC B)	At CVBS, Y signal is developed. At RGB, R signal is developed. At YUV, V signal is developed.
106	C/B/U (DAC C)	At CVBS, C signal is developed. At RGB, B signal is developed. At YUV, U signal is developed.
103	CVBS/C (DAC D)	Develops either of CVBS or C signal.
108	RSET	Insert a resistor load for DAC gain adjustment between GND and DAC.

Table 3-5-5 ZR36732 (3/5)

Pin No.	Name	Function
111	VREF	Apply reference voltage for DAC gain adjustment.
100	COSYNC	Composite sync output. Only when RGB analog output is selected, the pin takes effective. For other case, the pin is fixed to Low.
Digital video port (5 pins)		
127	VCLKx2	Main video clock input or output. 27.000 MHz.
92	VCLK	Two-divided VCLKx2 signal. The signal is used as data and sync signal qualifier.
95	HSYNC	Horizontal sync bidirectional signal pin. The polarity and length are programmable.
93	VSYNC	Vertical sync bidirectional signal pin. The polarity and length are programmable.
96	FI	Field identification bidirectional signal pin. The polarity is programmable.
Digital audio port (8 pins)		
131	AMCLK	Audio master clock input/output. The sampling frequency can be selected among 384fs, 256fs, 192fs and 128fs. (programmable)
133	S/PDIF (AOUT[3])	S/PDIF transmitter output. Available to connect to DAC as the 4th audio output (AOUT[3]). After reset, the pin develops low level signal.
136 | 138	AOUT[2:0]	PCM stereo audio serial output for DAC. After reset, the pin develops low level signal.
113	AIN	PCM stereo audio serial input for ADC.
139	ALRCLK	AOUT [4:0] and LR clock output of AIN. The square waveform appears in the sampling frequency. The polarity of LR is programmable.
141	ABCLK	AOUT [4:0] and bit clock output of AIN. AOUT is developed at the rising and falling edges of the clock signal and AIN is latched.
DVD-DSP interface (13 pins)		
151	DVDREQ	DVD-DSP data request output (polarity programmable).
149	DVDVALID	DVD-DSP data effective input (polarity programmable).
148	DVDSOS	DVD-DSP data sector start input (polarity programmable).
152 | 159	DVDDAT [7:0]	DVD-DSP data input bus.
150	DVDSTRB	DVD-DSP data bit strobe (clock) input. Polarity programmable.
147	DVDERR	DVD-DSP error input. Polarity programmable.

Table 3-5-5 ZR36732 (4/5)

Pin No.	Name	Function
SDRAM interface (35 pins)		
68, 70, 72, 74 | 76, 78, 79, 81, 82, 84, 85, 87, 88, 90, 91	RAMDAT [15:0]	SDRAM bidirectional data bus.
41, 42, 43, 45 | 48, 50, 51, 53 | 55	RAMADD [11:0]	SDRAM address bus output.
60	RAMRAS#	SDRAM row selection (active: low) output.
61	RAMCAS#	SDRAM column selection (active: low) output.
66	PCLK	SDRAM clock output (same as internal process clock).
64	RAMDQM	SDRAM data masking (active: high) output.
57	RAMCS0#	SDRAM chip select (active: low) output. Lower 2 Mbyte device.
59	RAMCS1#	SDRAM chip select (active: low) output. Upper 2 Mbyte device.
62	RAMWE#	SDRAM write enable (active: low) output.
TEST signal (3 pins).		
125	SCNENBL	Test pin. Connect to GNDP in normal use.
129	TESTMODE	Test pin. Connect to GNDP in normal use.
112	ICEMODE	Test pint Connect to VDDP in normal use.
Power supply signal (49 pins).		
10, 40, 49, 56, 65, 69, 80, 86, 97, 128, 146	GNDP	GND for 3.3V digital power supply.
3, 16, 26, 38, 44, 52, 58, 67, 71, 77, 83, 89, 94, 98, 126, 135, 140	VDDP	3.3V digital power supply.

Table 3-5-5 ZR36732 (5/5)

Pin No.	Name	Function
19, 99	VDDIP	3.3V digital power supply.
132	GNDAAM	GND for PLL power supply of 3.3V AMCLK generation.
130	VDDAAM	PLL power supply for 3.3V AMCLK generation.
14, 35, 73, 114, 144	GNDC	GND for 1.8V digital power supply.
63, 12, 33, 116, 142	VDDC	1.8V digital power supply.
123	GNDA	GND for PLL power supply of 1.8V internal clock generation.
121	VDDA	PLL power supply for 1.8V internal clock generation.
104	VDDD	Analog power supply for 3.3V video DAC.
101, 107, 109, 110	GNDDAC [D, B, P, S]	GND for analog power supply of 3.3V video DAC.

Main Circuit Diagram

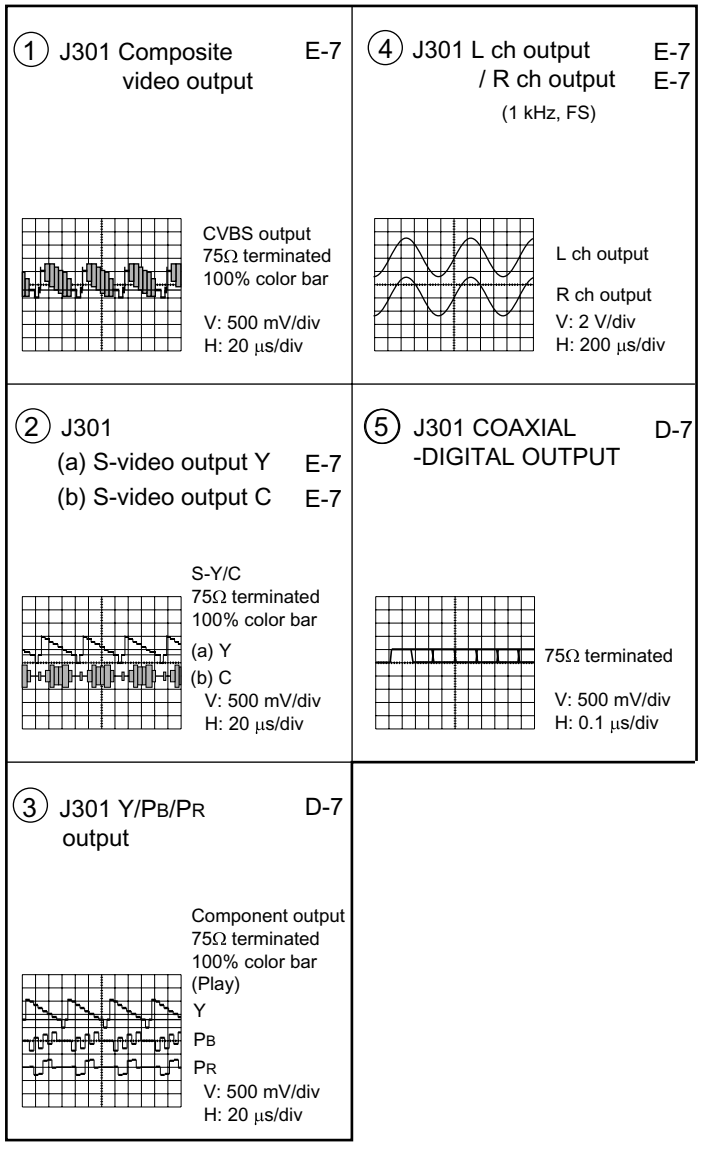


Fig. 3-5-5

5-3-2. Main Circuit Diagram

SYMBOL DIFFERENCE LIST				
MODEL / SYMBOL	NORTH AMERICA MODEL	JAPAN MODEL	ASIA MODEL	EUROPE MODEL
XYKK				
JPN MODEL ONLY	NC	USE	NC	NC
EUROPE MODEL ONLY	NC	NC	NC	USE

MODEL / SYMBOL	CD-R MODEL	NON CD-R MODEL
G504- G505 R526- R527 R528- R529 R523	USE	NC
R501- R547	NC	91
R504	NC	4.7
CN501	23pin	18pin

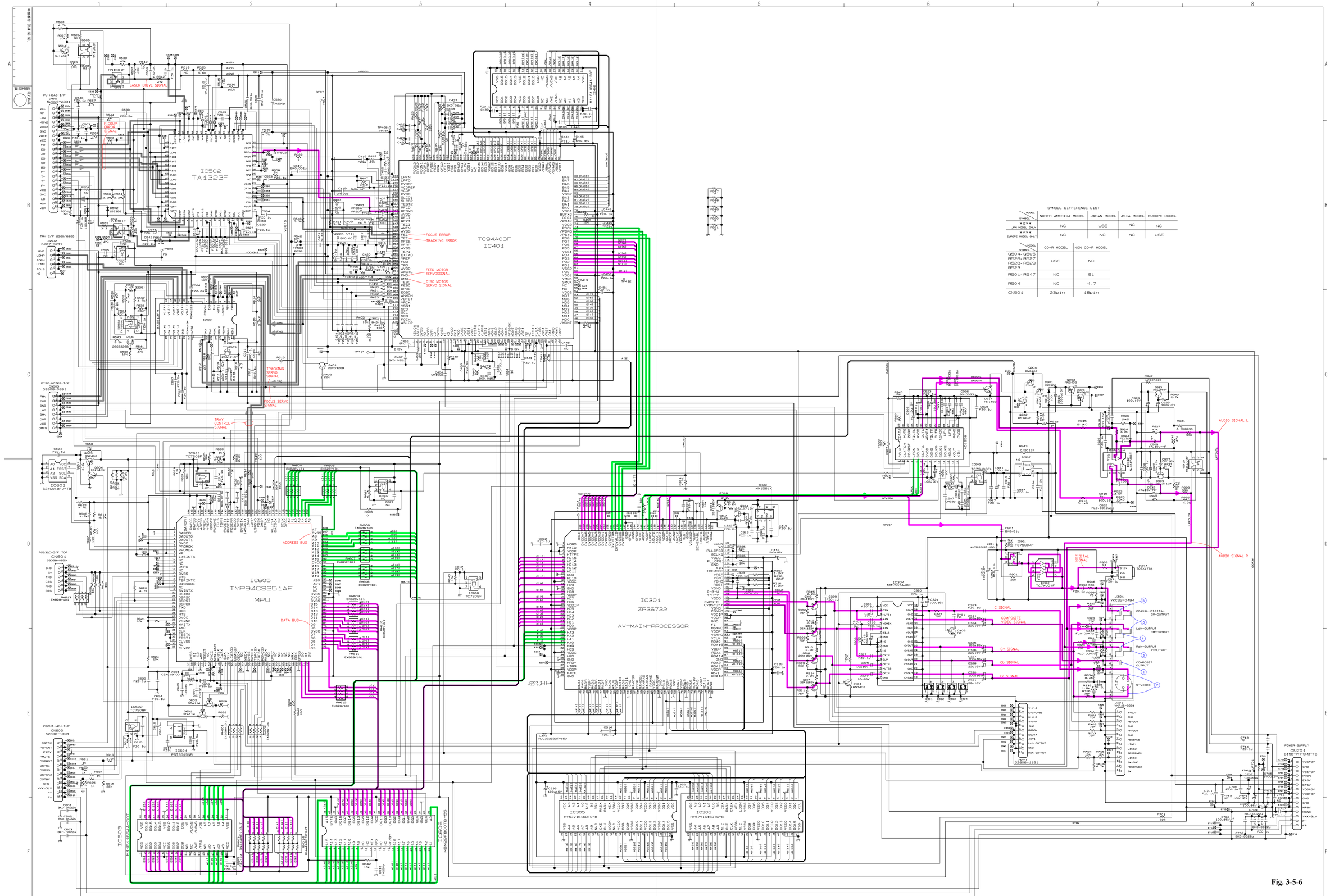
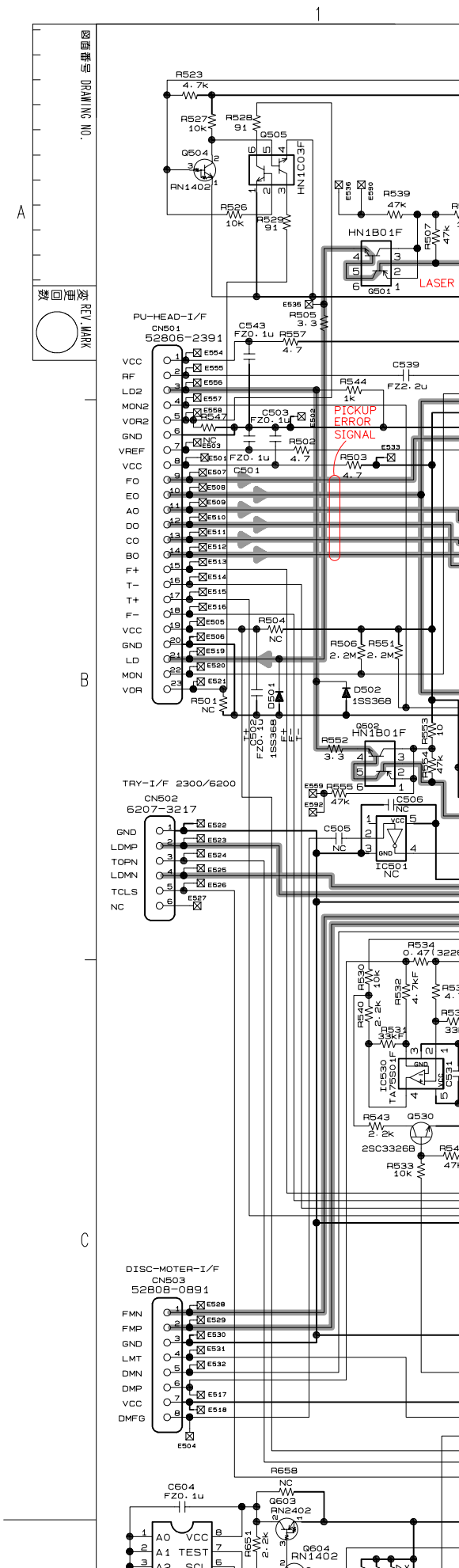


Fig. 3-5-6

5-3-2. Main Circuit Diagram



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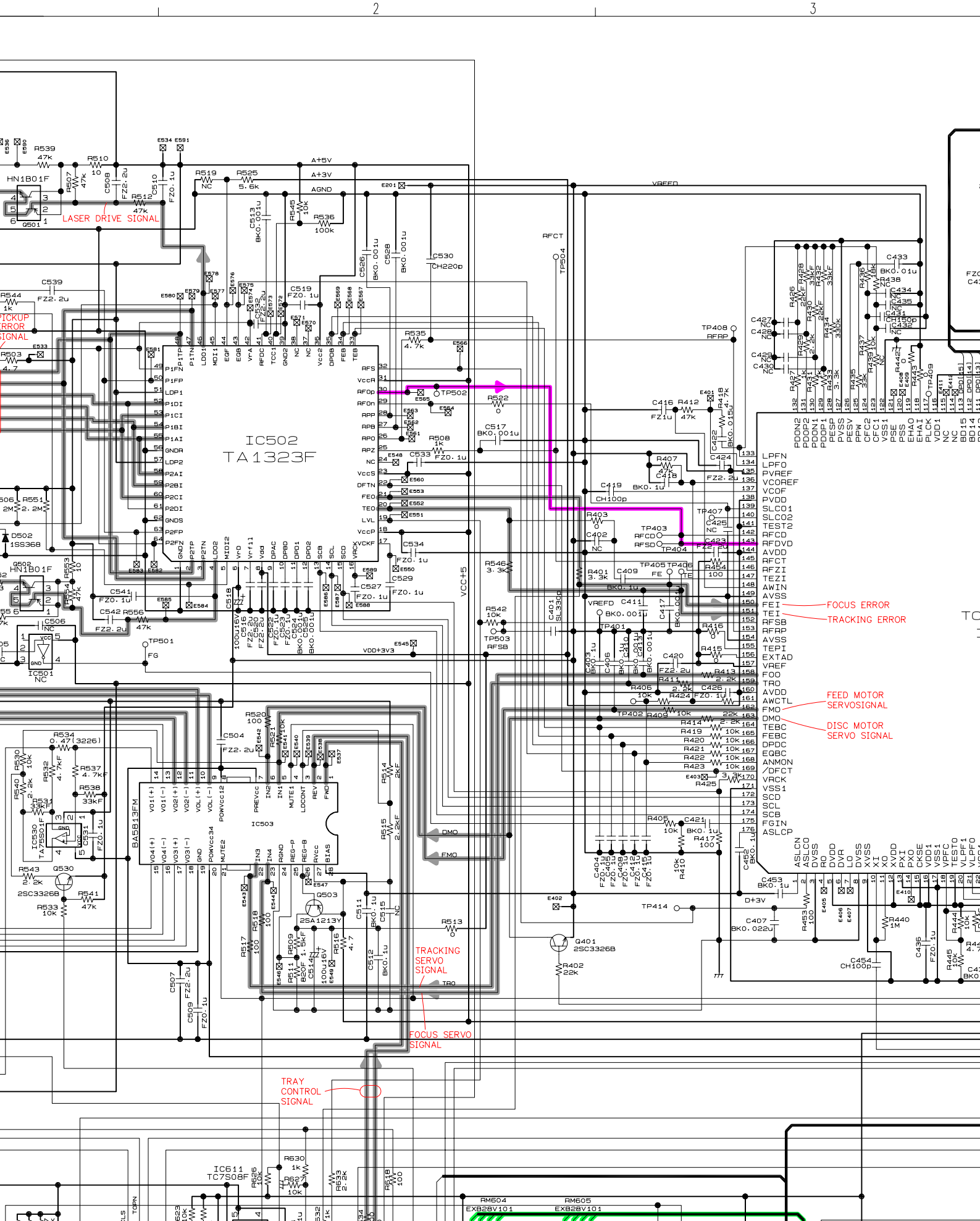
IC502
TA1323F
LASER DRIVE SIGNAL
PICKUP ERROR SIGNAL
FOCUS ERROR
TRACKING ERROR
FEED MOTOR SERVOSIGNAL
DISC MOTOR SERVO SIGNAL
TRACKING SERVO SIGNAL
FOCUS SERVO SIGNAL
TRAY CONTROL SIGNAL
IC503
BA5B13FM
IC501
IC530
TA7530F
IC611
TC7S08F
Q503
2SA1213Y
Q401
2SC3326B
Q530
2SC3326B
Q501
HN1B01F
Q502
HN1B01F
D502
1SS368
A+5V
A+3V
AGND
VREFD
VCC+5
D+3V
VDD+3V3
RFCT
TP504
TP502
RFRP
TP408
TP501
FG
TP503
RFSB
TP403
RFCD
RFSD
TP404
TP405
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TP402
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FMO
TRO
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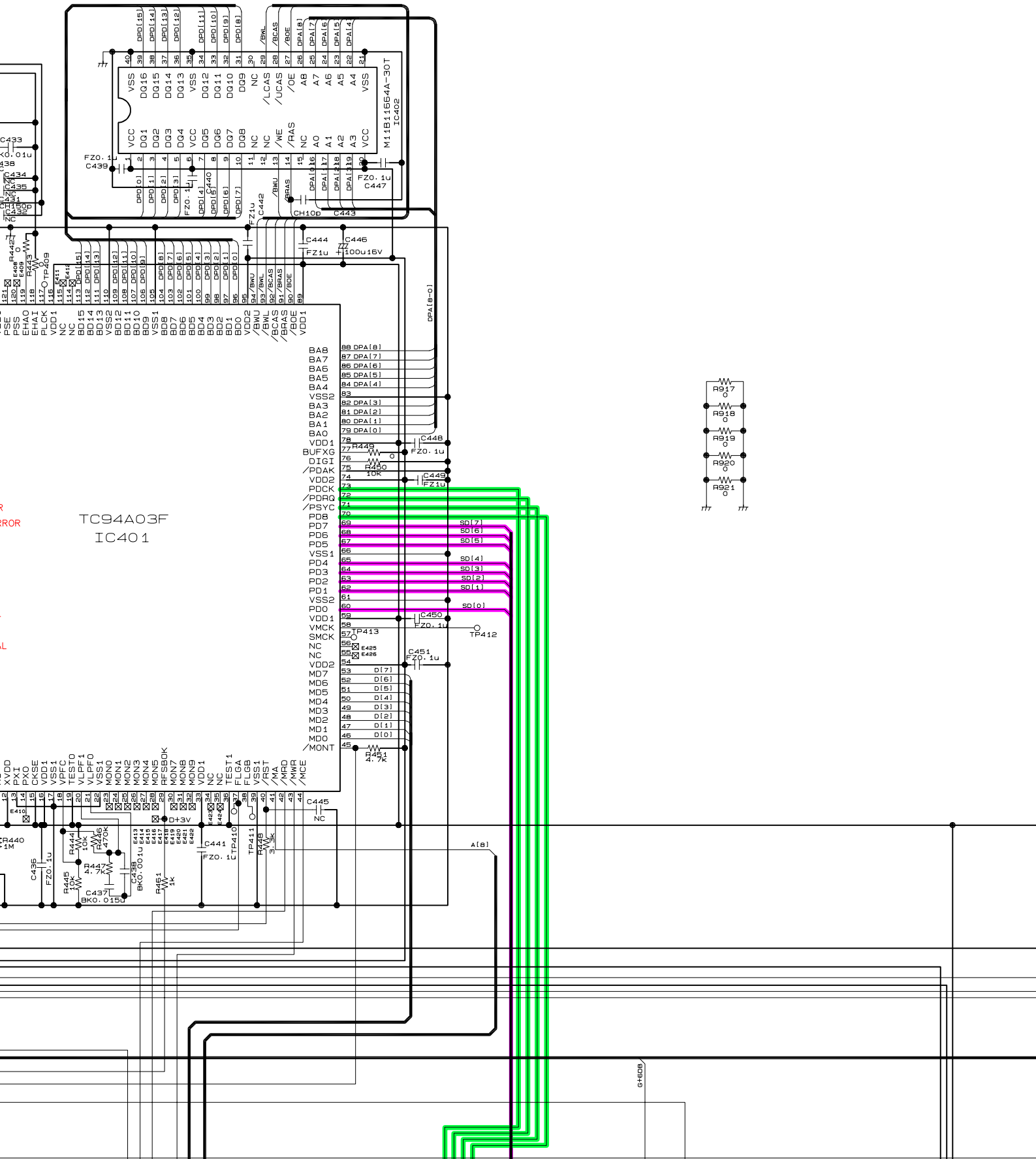
EXB28V101
RM605
EXB28V101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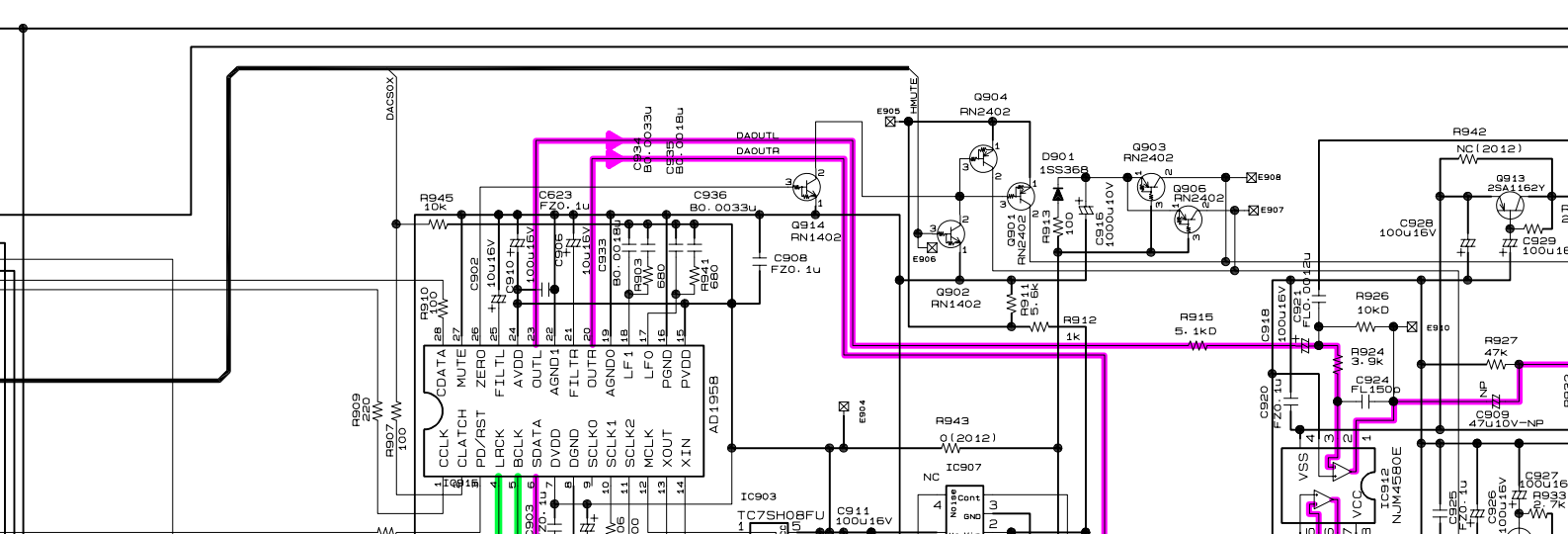
IC402
TC94A03F
IC401
R917 0
R918 0
R919 0
R920 0
R921 0

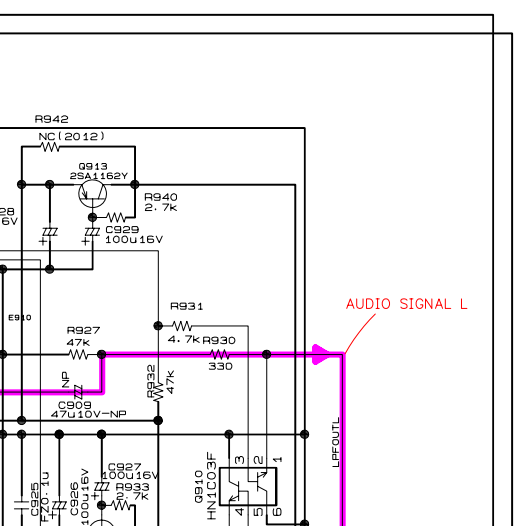
SYMBOL DIFFERENCE LIST

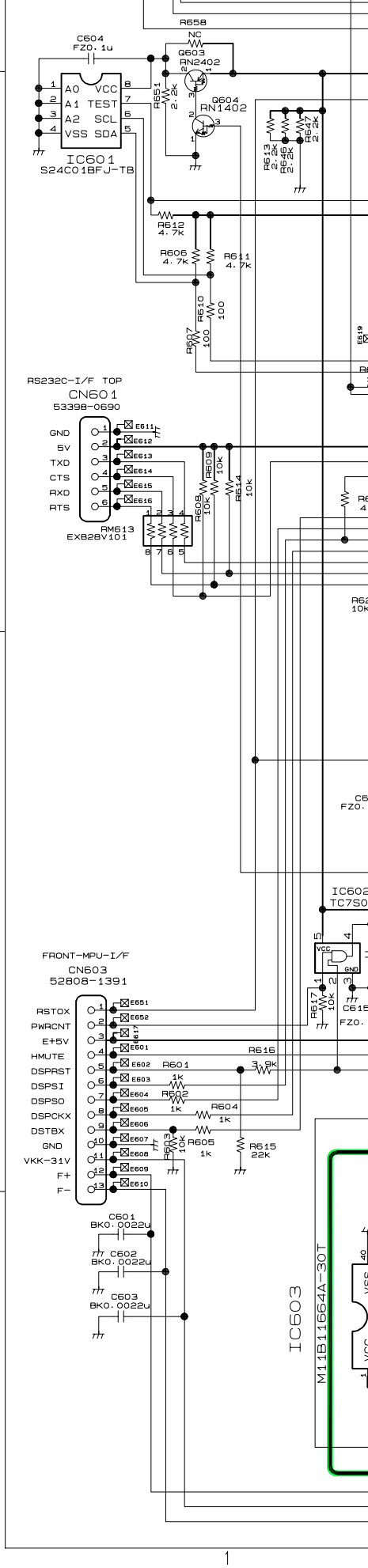
SYMBOL \ MODEL	NORTH AMERICA MODEL	JAPAN MODEL	ASIA MODEL	EUROPE MODE
＊X＊＊ JPN MODEL ONLY	NC	USE	NC	NC
＊Y＊＊ EUROPE MODEL ONLY	NC	NC	NC	USE

SYMBOL \ MODEL	CD-R MODEL	NON CD-R MODEL
Q504, Q505 R526, R527 R528, R529 R523	USE	NC
R501, R547	NC	91
R504	NC	4.7
CN501	23pin	18pin



ODEL	EUROPE MODEL
	NC
	USE

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C604
FZ0.1u
NC
Q603
RN2402
Q604
RN1402
IC601
S24C01BFJ-TB
A0 VCC
A1 TEST
A2 SCL
VSS SDA
R651 2.2k
R613 2.2k
R646 2.2k
R647 2.2k
R612 4.7k
R606 4.7k
R611 4.7k
R610 100
R607 100
RS232C-I/F TOP
CN601
53398-0690
GND
5V
TXD
CTS
RXD
RTS
E611
E612
E613
E614
E615
E616
R609 10k
R608 10k
R614 10k
RM613
EXB28V101
FRONT-MPU-I/F
CN603
52808-1391
RSTOX
PWRCNT
E+5V
HMUTE
DSPRST
DSPSI
DSPSO
DSPCKX
DSTBX
GND
VKK-31V
F+
F-
E651
E652
E617
E601
E602
E603
E604
E605
E606
E607
E608
E609
E610
R601 1k
R602 1k
R603 10k
R604 1k
R605 1k
R616 3.9k
R615 22k
C601
BK0.0022U
C602
BK0.0022U
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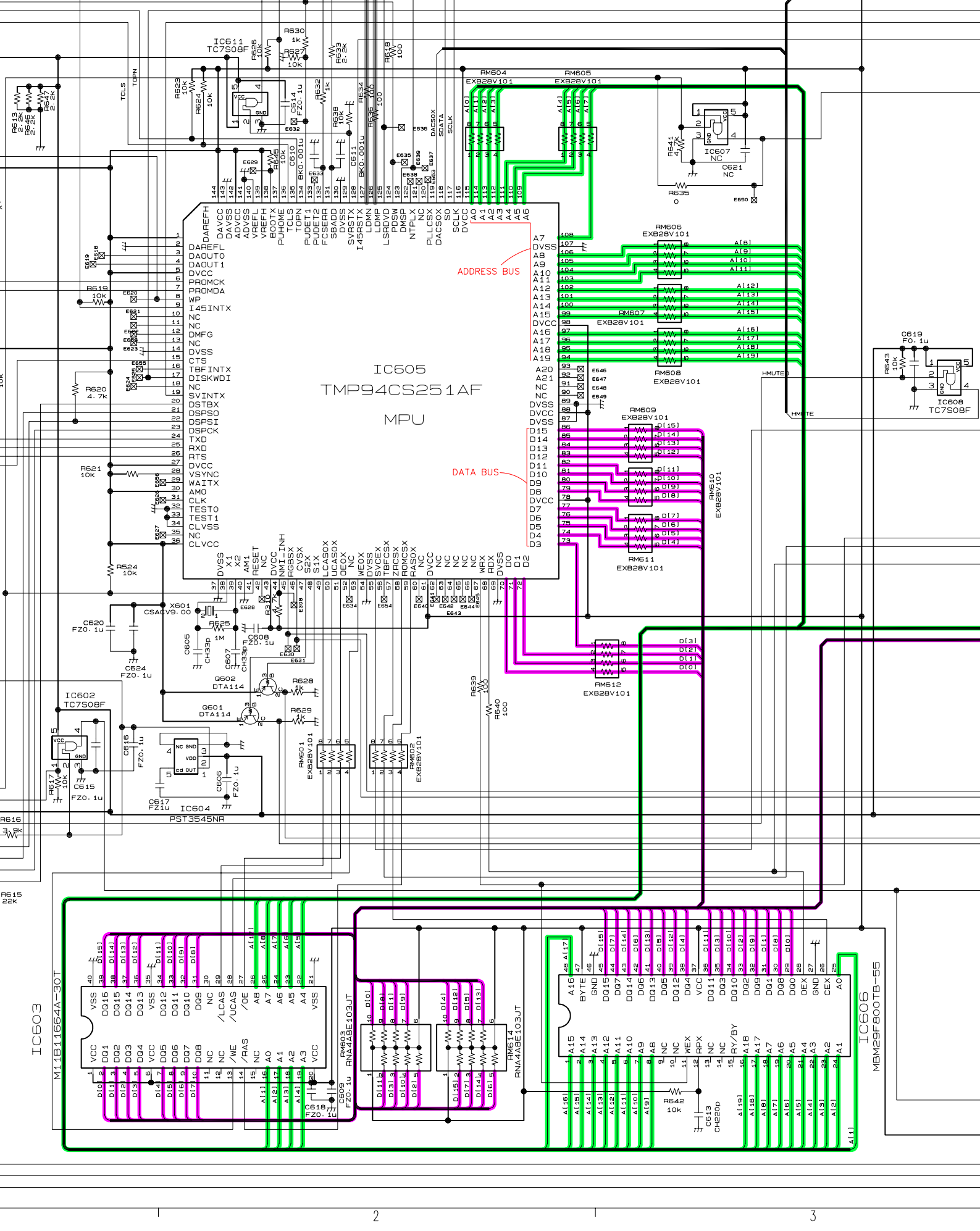
IC603
M11B116664A-30T
D
E
F
1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TMP94CS251AF
MPU
ADDRESS BUS
DATA BUS
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TC7S08F
IC602
TC7S08F
IC604
PST3545NR
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IC606
MBM29F800TB-55
IC607
NC
IC608
TC7S08F
X601
CSACV9.00
Q601
DTA114
Q602
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RM601
EXB28V101
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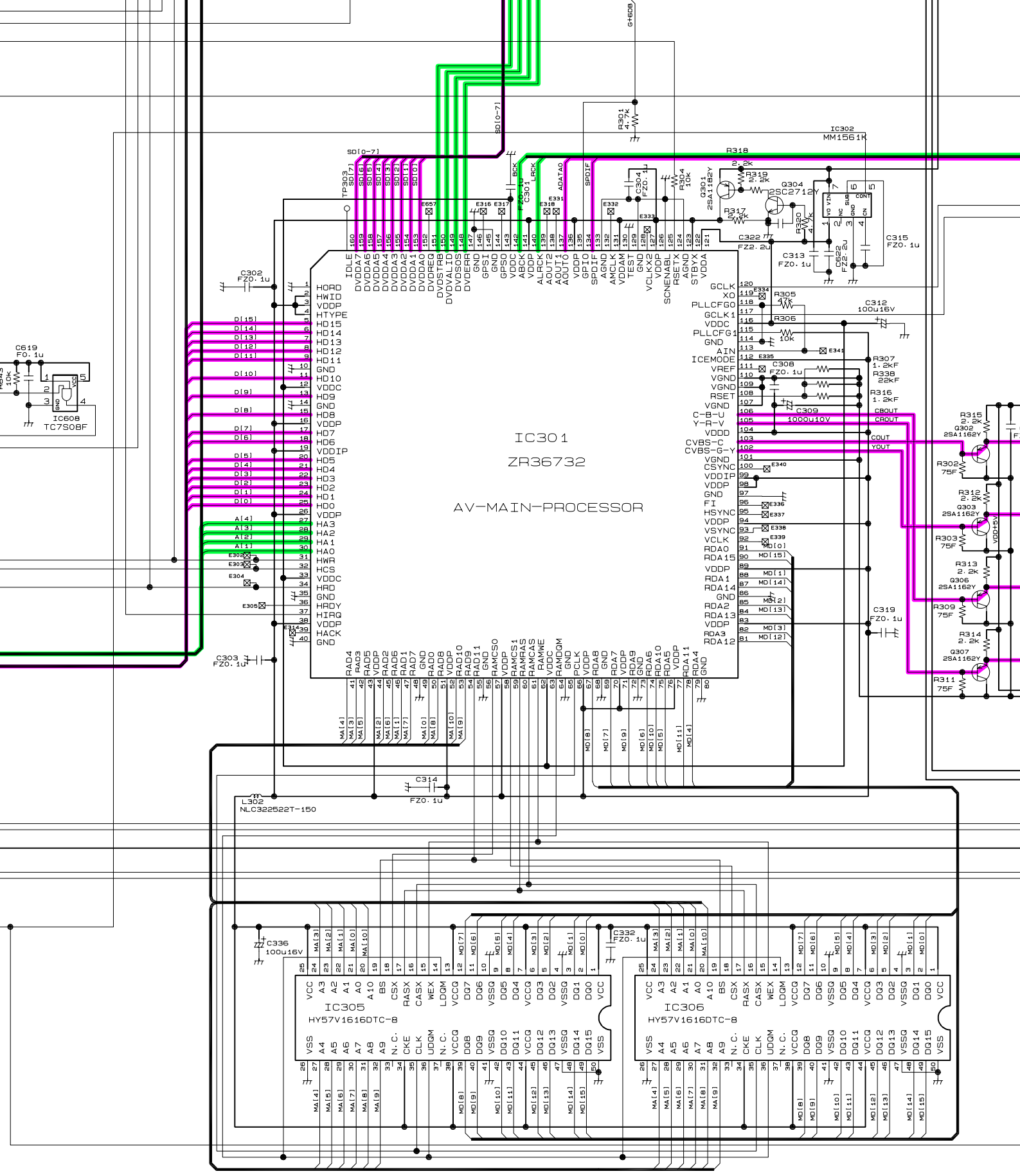
HMUTE
TOPN
TCLS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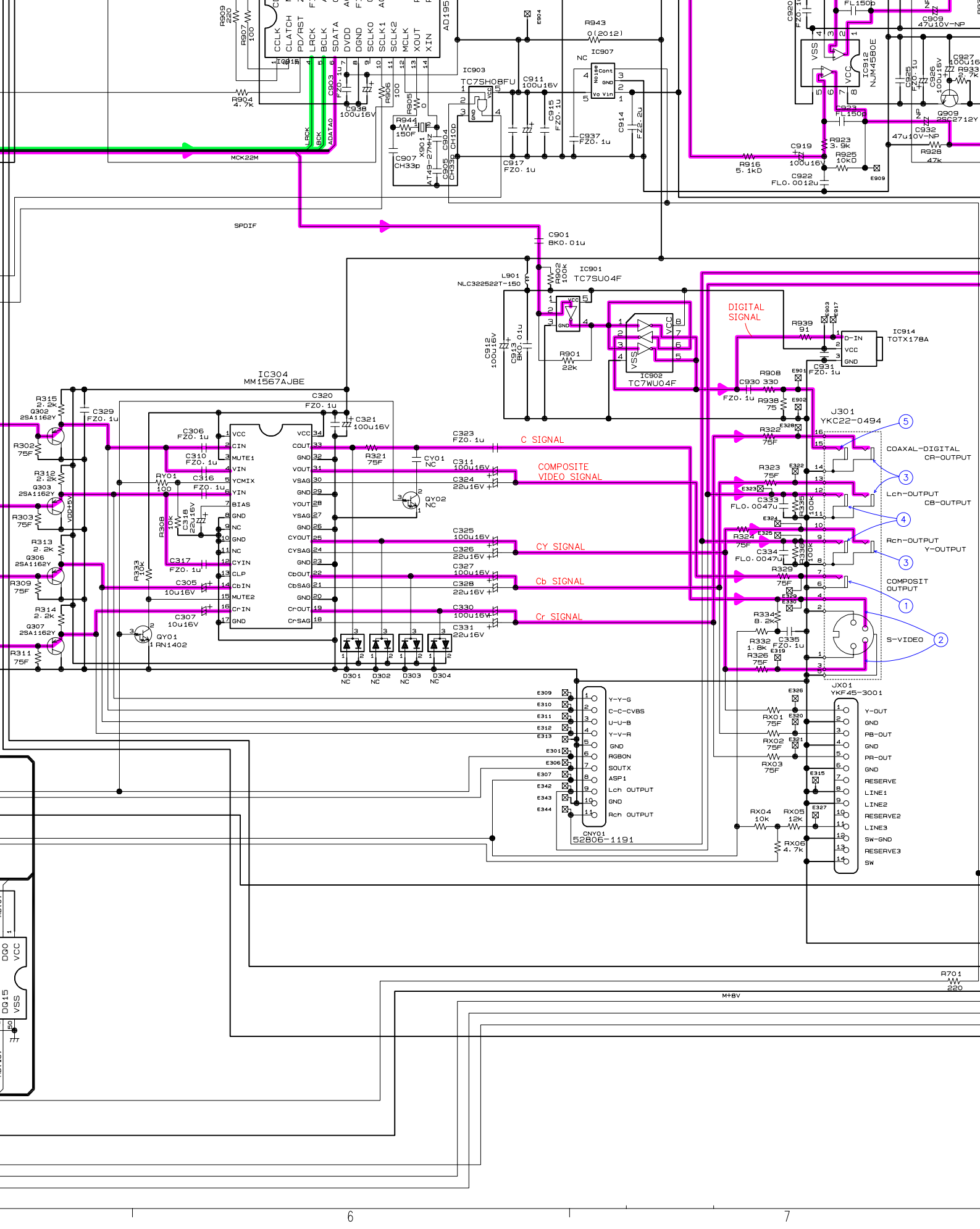
ZR36732
AV-MAIN-PROCESSOR
IC302
MM1561K
IC305
HY57V1616DTC-8
IC306
HY57V1616DTC-8
IC608
TC7S08F
L302
NLC322522T-150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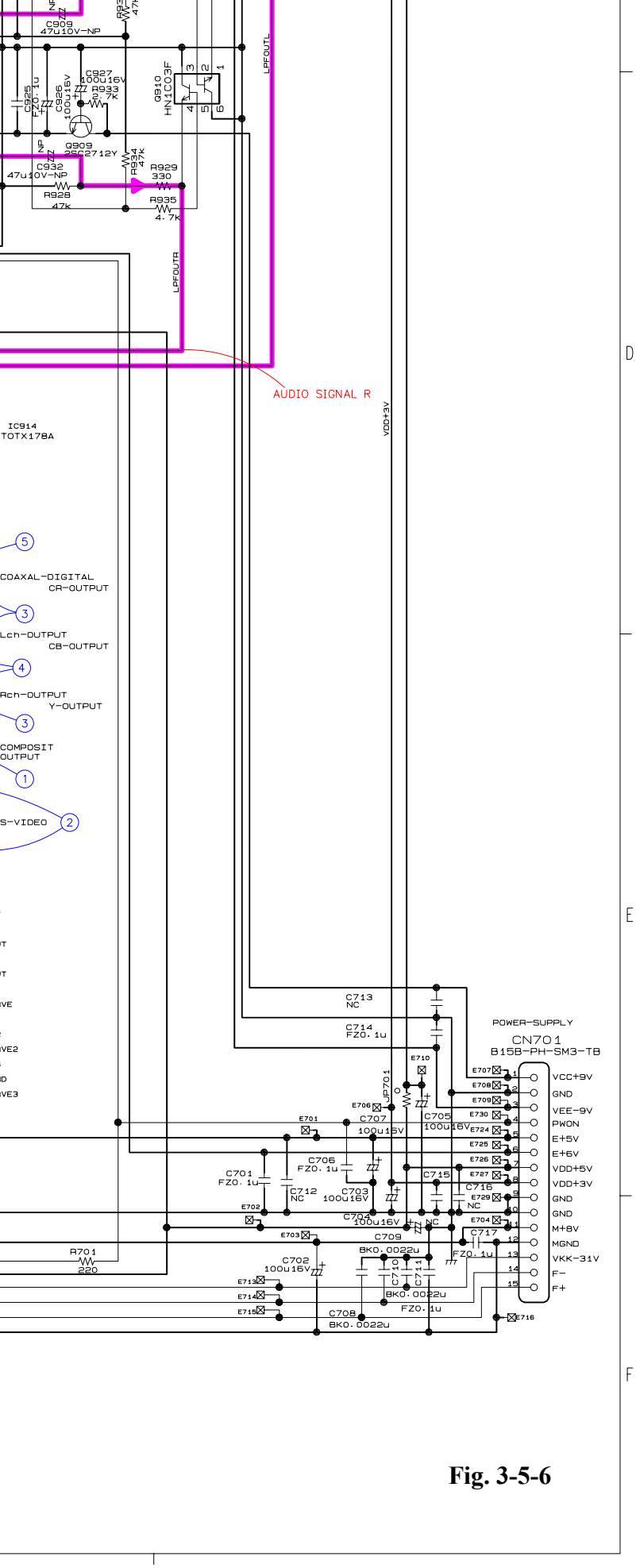
IC901
TC7SU04F
IC902
TC7WU04F
IC903
TC7SH08FU
IC907
NC
IC912
NJM4580E
IC914
TOTX178A
L901
NLC322522T-150
J301
YKC22-0494
JX01
YKF45-3001
CNY01
52806-1191
SPDIF
MCK22M
DIGITAL SIGNAL
C SIGNAL
COMPOSITE VIDEO SIGNAL
CY SIGNAL
Cb SIGNAL
Cr SIGNAL
COAXAL-DIGITAL CR-OUTPUT
Lch-OUTPUT CB-OUTPUT
Rch-OUTPUT Y-OUTPUT
COMPOSIT OUTPUT
S-VIDEO
Y-OUT
GND
PB-OUT
GND
PR-OUT
GND
RESERVE
LINE1
LINE2
RESERVE2
LINE3
SW-GND
RESERVE3
SW
Y-Y-G
C-C-CVBS
U-U-B
Y-V-R
GND
RGBON
SOUTX
ASP1
Lch OUTPUT
GND
Rch OUTPUT
M+8V
VDD+5V
DQ0 VCC
DQ15 VSS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C927
100u16V
R933
4.7k
C925
FZ0.1u
C926
100u16V
Q909
2SC2712Y
C932
47u10V-NP
R928
47k
R934
47k
R929
330
R935
4.7k
Q910
HN1C03F
LRFOUTL
LRFOUTR
AUDIO SIGNAL R
VDD+3V
IC914
TOTX178A
COAXAL-DIGITAL
CR-OUTPUT
Lch-OUTPUT
CB-OUTPUT
Rch-OUTPUT
Y-OUTPUT
COMPOSIT
OUTPUT
S-VIDEO
C713
NC
C714
FZ0.1u
POWER-SUPPLY
CN701
B15B-PH-SM3-TB
VCC+9V
GND
VEE-9V
PWON
E+5V
E+6V
VDD+5V
VDD+3V
GND
GND
M+8V
MGND
VKK-31V
F-
F+
JP701
C707
100u16V
C705
100u16V
C706
FZ0.1u
C701
FZ0.1u
C712
NC
C703
100u16V
C704
100u16V
C715
C716
NC
C717
FZ0.1u
C709
BK0.0022u
C702
100u16V
C710
C711
BK0.0022u
FZ0.1u
C708
BK0.0022u
R701
220

Fig. 3-5-6

5-4. Motor System Circuit Diagram

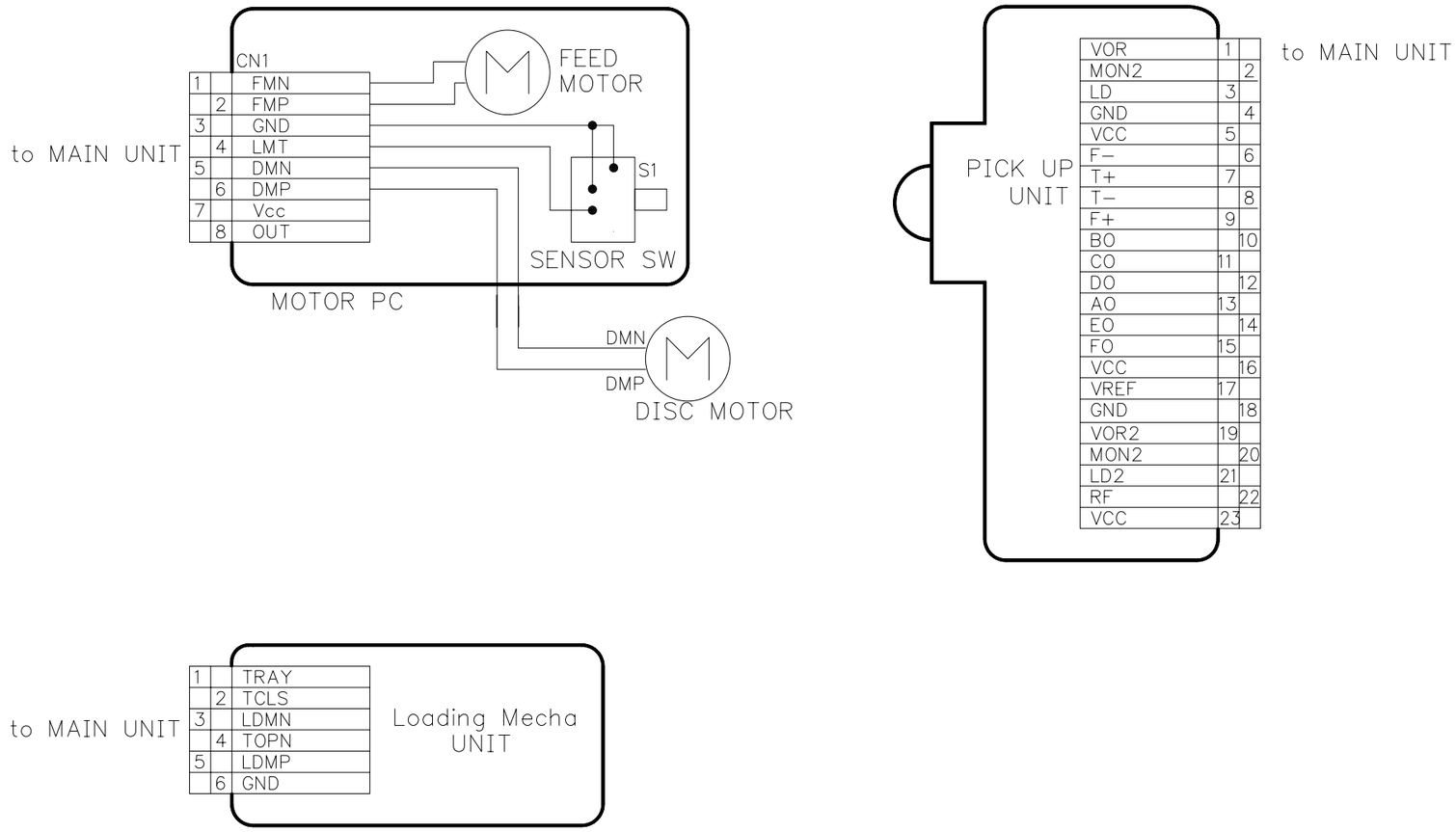
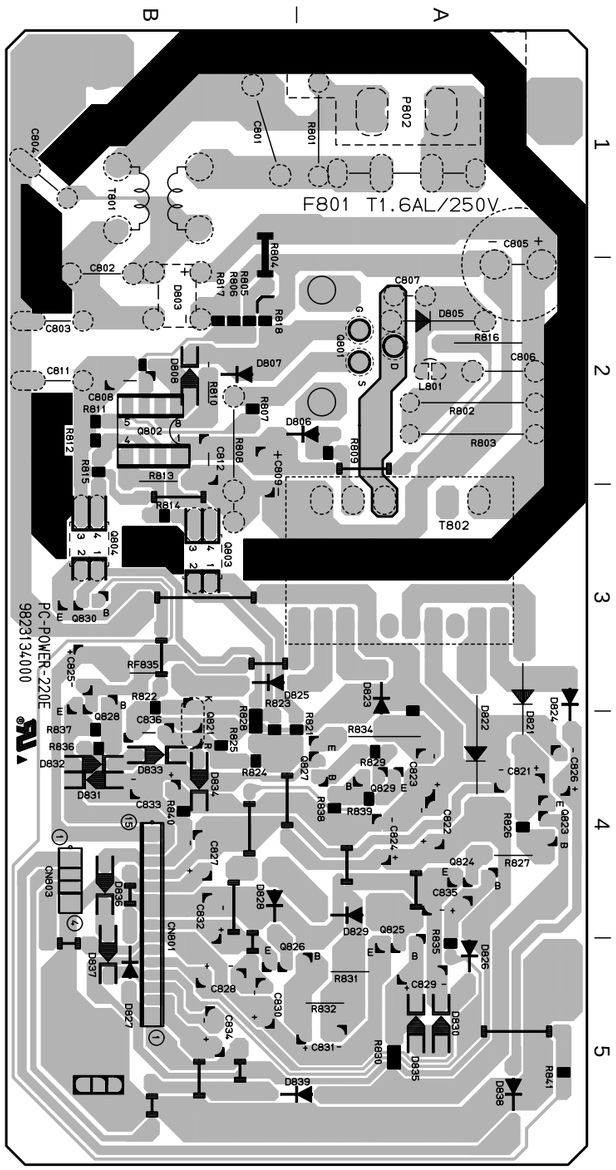


Fig. 3-5-7

6. PC BOARDS

6-1. Power Supply PC Board



Part No.	Location	Part No.	Location
C801	B1	Q801	A2
C802	B2	Q802	B2
C803	B2	Q803	B3
C804	B1	Q804	B3
C805	A2	Q821	B4
C806	A2	Q823	A4
C807	A2	Q824	A4
C808	B2	Q825	A5
C809	B3	Q826	B5
C811	B2	Q827	A4
C812	B2	Q828	B3
C821	A4	Q829	A4
C822	A4	Q830	B3
C823	A4	R801	A1
C824	A4	R802	A2
C825	B3	R803	A2
C826	A4	R804	B2
C827	B4	R805	B2
C828	B5	R806	B2
C829	A5	R807	B2
C830	B5	R808	B2
C831	A5	R809	A2
C832	B4	R810	B2
C833	B4	R811	B2
C834	B5	R812	B2
C835	A4	R813	B2
C836	B4	R814	B3
CN801	B4	R815	B2
CN803	B4	R816	A2
D803	B2	R817	B2
D805	A2	R818	B2
D806	B2	R821	A4
D807	B2	R822	B3
D808	B2	R823	B4
D821	A4	R824	B4
D822	A4	R825	B4
D823	A3	R826	A4
D824	A4	R827	A4
D825	B3	R828	B3
D826	A5	R829	A4
D827	B4	R830	A5
D828	B4	R831	A5
D829	A4	R832	B5
D830	A5	R833	A3
D831	B4	R834	A4
D832	B4	R835	A4
D833	B4	R836	B4
D834	B4	R837	B4
D835	A5	R838	A4
D836	B4	R839	A4
D837	B5	R840	B4
D838	A5	R841	A5
D839	B5	RF835	B3
F801	A1	T801	B1
L801	A2	T802	A3
P802	A1		

Fig. 3-6-1 EU02 Power Supply PC Board (Bottom side)

6-2. Power Switch PC Board

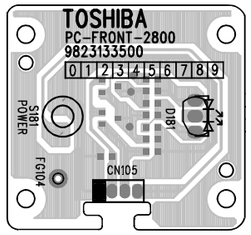


Fig. 3-6-2 EU04 Power Switch PC Board (Top side)

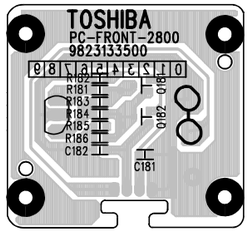


Fig. 3-6-3 EU04 Power Switch PC Board (Bottom side)

6-3. Front Display PC Board

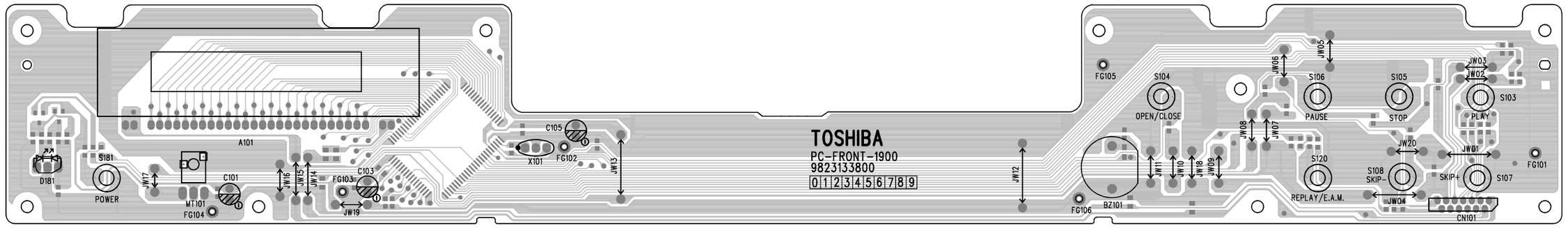


Fig. 3-6-4 EU03 Front Display PC Board (Top Side)

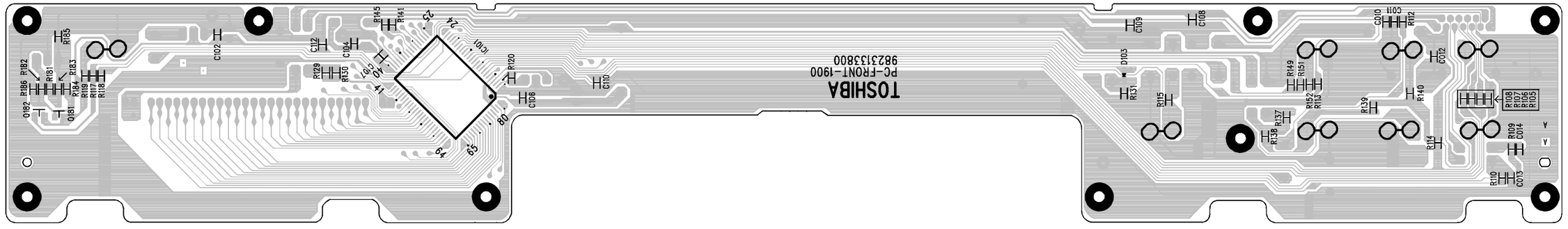


Fig. 3-6-5 EU03 Front Display PC Board (Bottom Side)

The parts location list shows ex.
A1/B1= top side/bottom side.

Part No.	Location	Part No.	Location	Part No.	Location		
A101	B2/ –	FG103	B3/ –	JW19	C3/ –	R138	– /D8
BZ101	C7/ –	FG104	C2/ –	JW20	B9/ –	R139	– /D9
C010	– /C9	FG105	B7/ –	MT101	C2/ –	R140	– /D9
C011	– /C9	FG106	C7/ –	Q181	– /D1	R141	– /C3
C012	– /D9	IC101	– /D3	Q182	– /D1	R145	– /C3
C013	– /D10	JW01	B9/ –	R105	– /D10	R149	– /D8
C014	– /D10	JW02	B9/ –	R106	– /D10	R151	– /D8
C101	B2/ –	JW03	B9/ –	R107	– /D10	R152	– /D8
C102	– /D3	JW04	C9/ –	R108	– /D10	R181	– /D1
C103	B3/ –	JW05	B9/ –	R109	– /D10	R182	– /D1
C104	– /D3	JW06	B8/ –	R110	– /D10	R183	– /D1
C105	B4/ –	JW07	B8/ –	R112	– /C9	R184	– /D1
C106	– /D4	JW08	B8/ –	R113	– /D9	R185	– /D1
C107	– /D3	JW09	B8/ –	R114	– /D9	R186	– /D1
C108	– /C8	JW10	B8/ –	R115	– /D8	S103	B10/ –
C109	– /C7	JW11	B8/ –	R117	– /D1	S104	B8/ –
C110	– /D4	JW12	B7/ –	R118	– /D1	S105	B9/ –
C112	– /D3	JW13	B4/ –	R119	– /D1	S106	B9/ –
CN101	C9/ –	JW14	B2/ –	R120	– /D4	S107	B10/ –
D103	– /D7	JW15	B2/ –	R129	– /D3	S108	B9/ –
D181	B1/ –	JW16	B2/ –	R130	– /D3	S120	B9/ –
FG101	B10/ –	JW17	B1/ –	R131	– /D7	S181	B1/ –
FG102	B4/ –	JW18	B8/ –	R137	– /D8	X101	B4/ –

6-4. Main PC Board

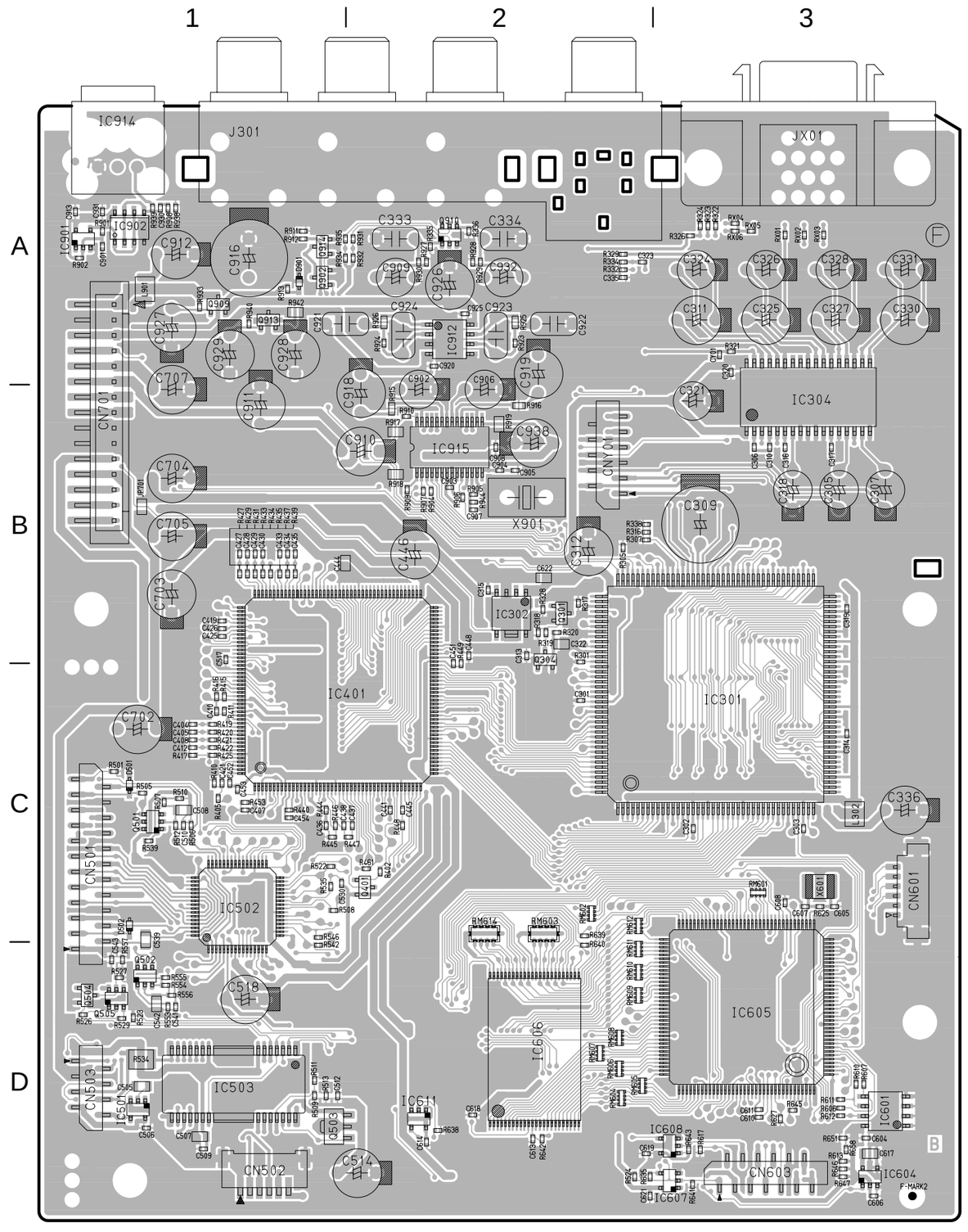


Fig. 3-6-6 EU01 Main PC Board (Top pattern and Top parts location diagram)

Main PC Board (Top Side)

Part No.	Location	Part No.	Location	Part No.	Location	Part No.	Location
C301	C2	C611	D3	Q401	C2	R554	D1
C302	C3	C613	D2	Q501	C1	R555	D1
C303	C3	C614	D2	Q502	D1	R556	D1
C305	B3	C617	D3	Q503	D1	R557	D1
C306	B3	C618	D2	Q504	D1	R606	D3
C307	B3	C619	D2	Q505	D1	R607	D3
C309	B3	C621	D2	Q902	A1	R610	D3
C310	B3	C622	B2	Q909	A1	R611	D3
C311	A3	C702	C1	Q910	A2	R612	D3
C312	B2	C703	B1	Q913	A1	R613	D3
C313	B2	C704	B1	Q914	A1	R617	D3
C314	C3	C705	B1	R301	B2	R625	C3
C315	B2	C707	B1	R305	B2	R627	D3
C316	B3	C901	A1	R307	B2	R635	D2
C317	B3	C902	B2	R316	B2	R638	D2
C318	B3	C903	B2	R317	B2	R639	C2
C319	B3	C904	B2	R318	B2	R640	D2
C320	A3	C905	B2	R319	B2	R641	D3
C321	B3	C906	B2	R320	B2	R642	D2
C322	B2	C907	B2	R321	A3	R643	D3
C323	A2	C908	B2	R322	A3	R645	D3
C324	A3	C909	A2	R323	A3	R646	D3
C325	A3	C910	B2	R324	A3	R647	D3
C326	A3	C911	B1	R326	A3	R651	D3
C327	A3	C912	A1	R328	B2	R658	D3
C328	A3	C913	A1	R329	A2	R901	A1
C330	A3	C916	A1	R332	A2	R902	A1
C331	A3	C918	B2	R334	A2	R904	B2
C333	A2	C919	A2	R335	A2	R905	B2
C334	A2	C920	A2	R336	A2	R906	B2
C335	A2	C921	A1	R338	B2	R907	B2
C336	C3	C922	A2	R402	C2	R908	A1
C404	C1	C923	A2	R405	C1	R909	B2
C405	C1	C924	A2	R410	C1	R910	B2
C407	C1	C925	A2	R411	C1	R911	A1
C408	C1	C926	A2	R415	C1	R912	A1
C410	C1	C927	A1	R416	C1	R913	A1
C412	C1	C928	A1	R417	C1	R915	B2
C419	B1	C929	A1	R419	C1	R916	B2
C421	C1	C930	A1	R420	C1	R917	B2
C425	B1	C931	A1	R421	C1	R918	B2
C426	B1	C932	A2	R422	C1	R919	B2
C427	B1	C938	B2	R425	C1	R923	A2
C428	B1	CN501	C1	R427	B1	R924	A2
C429	B1	CN502	D1	R429	B1	R925	A2
C430	B1	CN503	D1	R431	B1	R926	A2
C433	B1	CN601	C3	R433	B1	R927	A2
C434	B1	CN603	D3	R434	B1	R928	A2
C435	B1	CN701	B1	R435	B1	R929	A2
C436	C1	CNY01	B2	R437	B1	R930	A2
C437	C2	CY01	A3	R439	B1	R931	A2
C438	C1	D501	C1	R440	C1	R932	A2
C441	C2	D502	C1	R444	C1	R933	A1
C444	B1	D901	A1	R445	C1	R934	A1
C445	C2	F-MARK1	A1	R446	C1	R935	A1
C446	B2	F-MARK2	D3	R447	C2	R938	A1
C448	B2	IC301	C3	R448	C2	R939	A1
C451	B2	IC302	B2	R449	B2	R940	A1
C452	C1	IC304	B3	R453	C1	R942	A1
C453	C1	IC401	C1	R461	C2	R944	B2
C454	C1	IC501	D1	R501	C1	RM601	C3
C505	D1	IC502	C1	R505	C1	RM602	C2
C506	D1	IC503	D1	R506	C1	RM603	C2
C507	D1	IC601	D3	R507	C1	RM604	D2
C508	C1	IC604	D3	R508	C1	RM605	D2
C509	D1	IC605	D3	R509	D1	RM606	D2
C510	C1	IC606	D2	R510	C1	RM607	D2
C512	D1	IC607	D3	R511	D1	RM608	D2
C514	D2	IC608	D3	R512	C1	RM609	D2
C517	B1	IC611	D2	R513	D1	RM610	D2
C518	D1	IC901	A1	R522	C1	RM611	D2
C530	C1	IC902	A1	R523	D1	RM612	C2
C539	C1	IC912	A2	R524	D2	RM614	C2
C541	D1	IC914	A1	R526	D1	RX01	A3
C542	D1	IC915	B2	R527	D1	RX02	A3
C543	D1	J301	A1	R529	D1	RX03	A3
C604	D3	JP701	B1	R534	D1	RX04	A3
C605	C3	JX01	A3	R535	C1	RX05	A3
C606	D3	L302	C3	R539	C1	RX06	A3
C607	C3	L901	A1	R542	D1	X601	C3
C608	C3	Q301	B2	R546	C1	X901	B2
C610	D3	Q304	B2	R553	D1		

Main PC Board (Bottom Side)

Part No.	Location	Part No.	Location	Part No.	Location
C304	B2	C716	B3	R436	B3
C308	B1	C717	B3	R438	B3
C329	B2	C914	B3	R442	B3
C332	C1	C915	B3	R443	B3
C401	C3	C917	B2	R450	B2
C402	C3	C933	B2	R451	C2
C403	C3	C934	B2	R454	B3
C406	C3	C935	B2	R502	C3
C409	C3	C936	B2	R503	C3
C411	C3	C937	B2	R504	C3
C413	C3	D301	A1	R514	D3
C415	C3	D302	A1	R515	D3
C416	C3	D303	A1	R516	D3
C417	C3	D304	A1	R517	D3
C418	B3	F-MARK3	A3	R518	D3
C420	C3	F-MARK4	D1	R519	C3
C422	B3	IC305	C1	R520	D3
C423	B3	IC306	B1	R521	D3
C424	B3	IC402	C2	R525	C3
C431	B3	IC530	D3	R528	D3
C432	B3	IC602	D1	R530	D3
C439	B2	IC603	D2	R531	D3
C440	B2	IC903	B2	R532	D3
C442	B2	IC907	B2	R533	D3
C443	C2	Q302	B1	R536	C3
C447	C2	Q303	B1	R537	D3
C449	C2	Q306	B1	R538	D3
C450	C2	Q307	B1	R540	D3
C501	C3	Q530	D3	R541	D3
C502	C3	Q601	C1	R543	D3
C503	C3	Q602	C1	R544	C3
C504	D3	Q603	D1	R545	C3
C511	D3	Q604	D1	R547	D3
C513	C3	Q901	A3	R551	C3
C515	D3	Q903	A3	R552	C3
C516	D3	Q904	A3	R601	D1
C519	C3	Q906	A3	R602	D1
C520	D3	QY01	B1	R603	D1
C522	C3	QY02	B1	R604	D1
C523	C3	R302	B1	R605	D1
C524	C3	R303	B1	R608	D1
C525	C3	R304	B2	R609	D1
C526	C3	R306	B2	R614	D1
C527	D3	R308	B1	R615	D1
C528	C3	R309	B2	R616	D1
C529	D3	R310	D1	R618	D1
C531	D3	R311	B1	R619	D1
C532	C3	R312	B1	R620	D1
C533	C3	R313	B2	R621	D1
C534	C3	R314	B1	R623	D1
C601	D1	R315	B1	R624	D1
C602	D1	R325	C1	R626	D1
C603	D1	R327	C1	R628	C1
C609	D2	R333	B1	R629	C1
C615	D1	R401	C3	R630	D1
C616	D1	R403	C3	R632	D1
C620	D1	R406	C3	R633	D1
C623	B2	R407	B3	R634	D1
C624	D1	R409	C3	R636	D1
C701	A3	R412	C3	R701	A3
C706	A3	R413	C3	R903	B2
C708	B3	R414	C3	R920	B2
C709	B3	R418	B3	R921	B2
C710	B3	R423	C3	R941	B2
C711	B3	R424	C3	R943	B3
C712	A3	R426	B3	R945	B2
C713	A3	R428	B3	RM613	D1
C714	A3	R430	B3	RY01	B1
C715	B3	R432	B3		

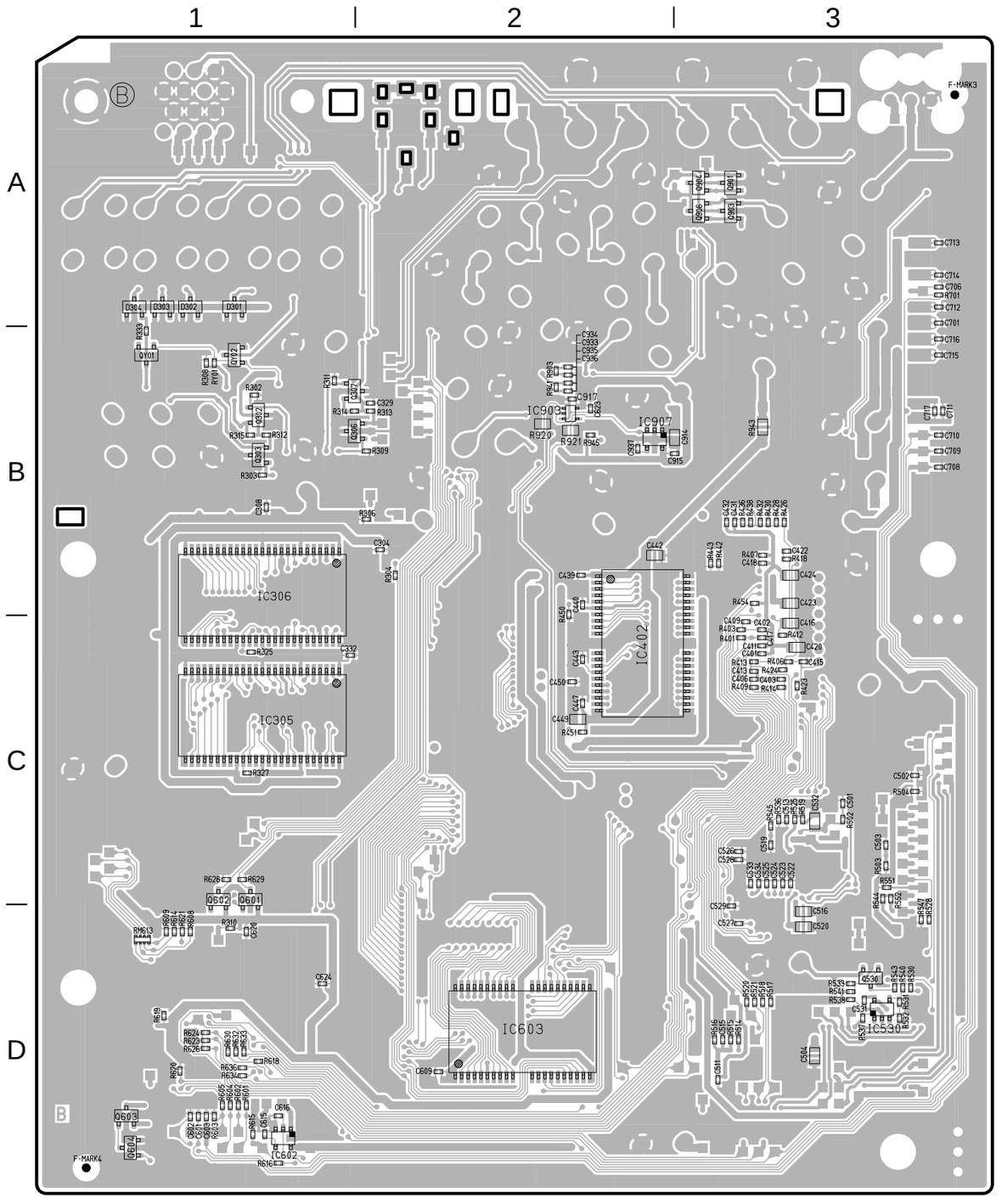


Fig. 3-6-7 EU01 Main PC Board (Bottom pattern and bottom parts location diagram)

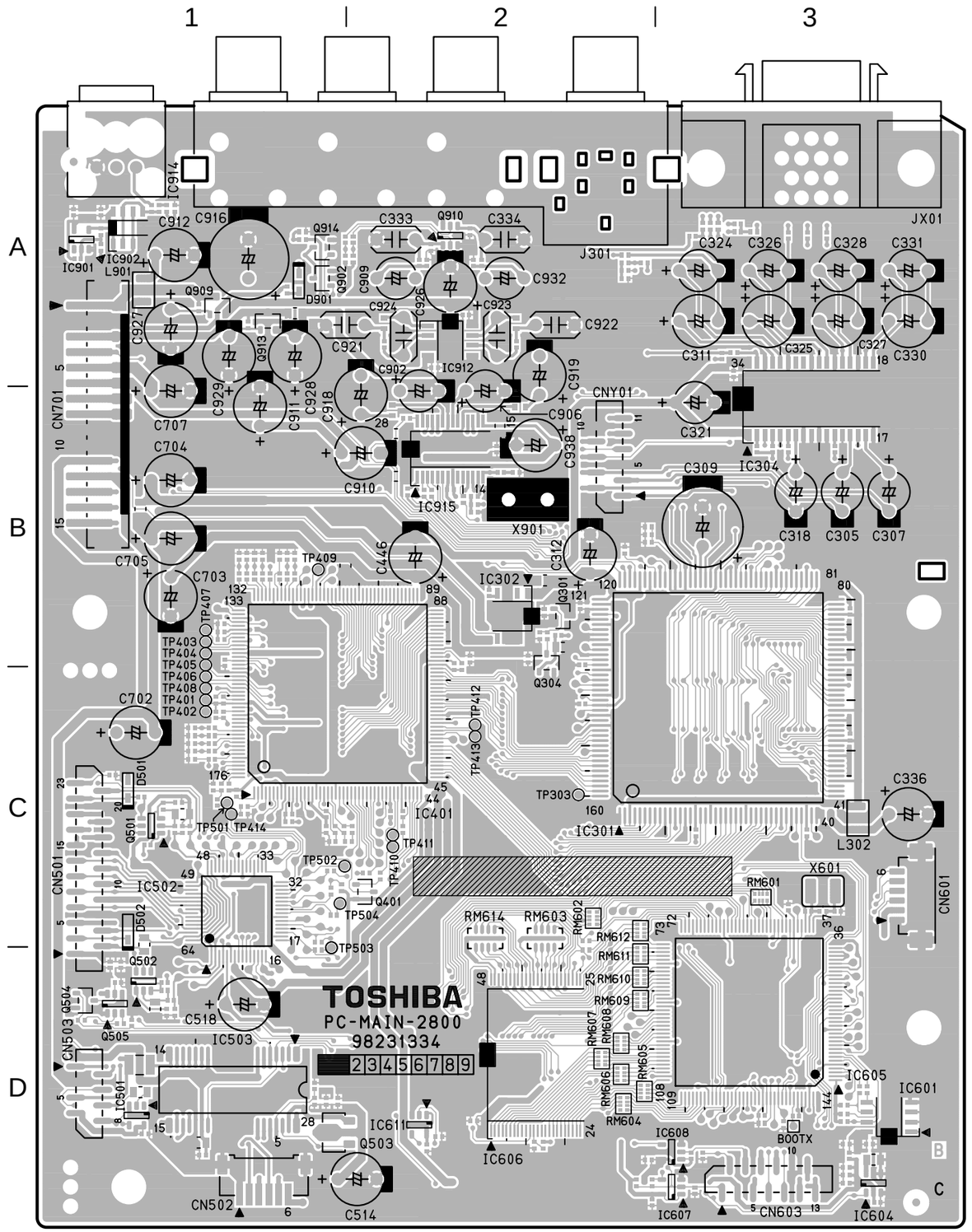


Fig. 3-6-8 EU01 Main PC Board (Top pattern, character/symbol)

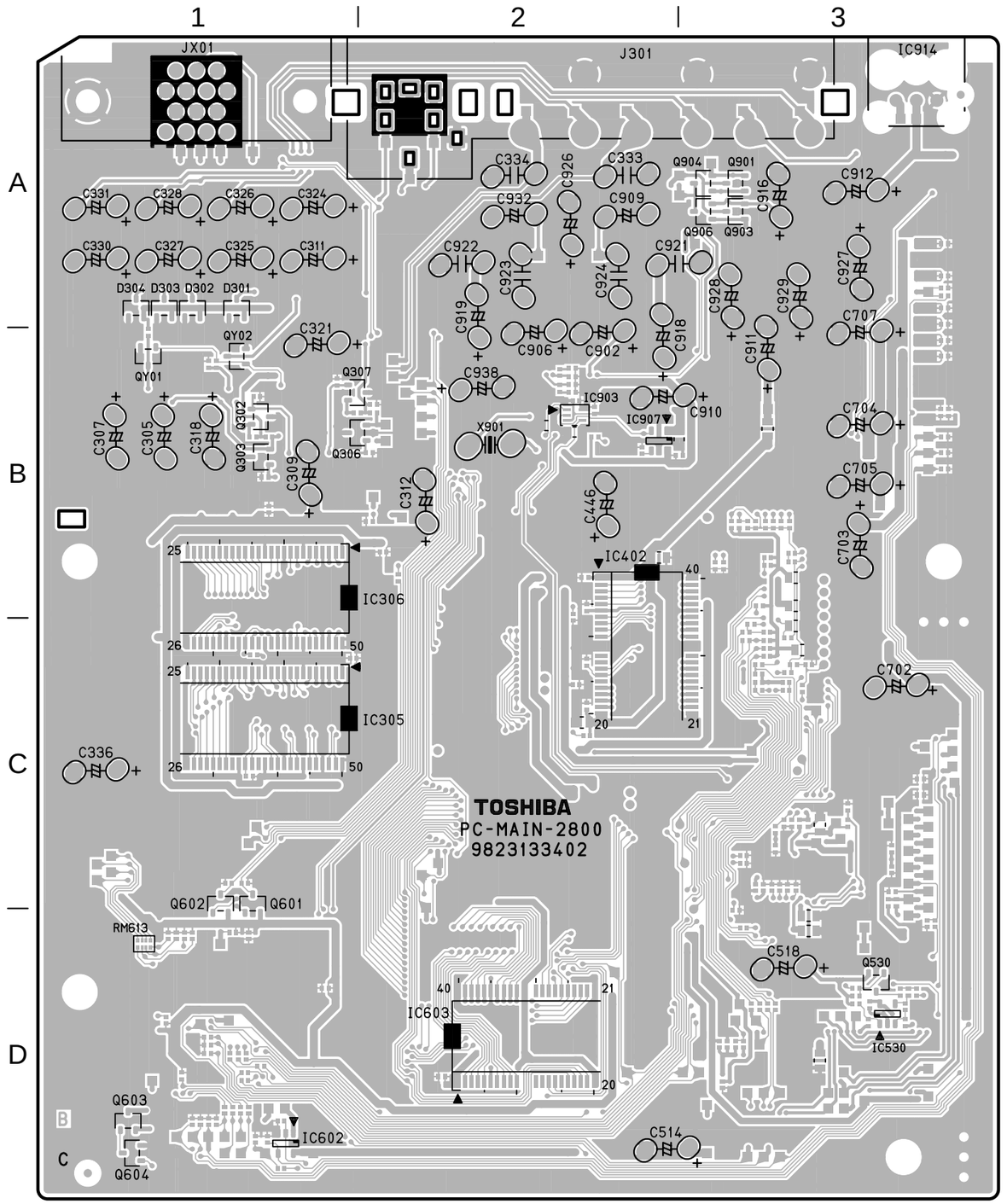


Fig. 3-6-9 EU01 Main PC Board (Bottom pattern, character/symbol)

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